Closeout Report for IHSS Group 900-12

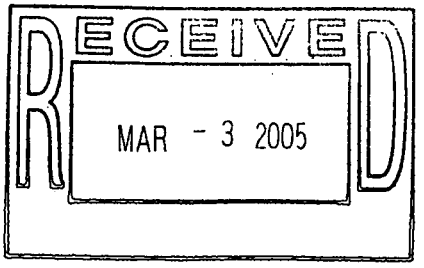
East Trenches

T-5 (IHSS NE-111.2), T-6 (IHSS NE-111.3), T-8 (IHSS NE-111.5), T-9a (IHSS NE-111.6a), T-9b (IHSS NE-111.6b), T-10 (IHSS NE-111.7), and T-11 (IHSS NE-111.8)

Approval received from the U.S. Environmental Protection Agency, Region VIII

(February 23, 2005).

Approval letter contained in the Administrative Record.



February 2005

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

1.0 INTRODUCTION 1

2.0 SITE CHARACTERIZATION 3

2.1 East Trenches, Historical Information and Data 8
2.2 Accelerated Action Characterization Data 10
2.3 Sums of Ratios 10

3.0 ACCELERATED ACTION 25

4.0 CONFIRMATION SAMPLING 26

5.0 POST-REMEDIATION CONDITIONS 29

6.0 SUBSURFACE SOIL RISK SCREEN 32

7.0 STEWARDSHIP ANALYSIS 34

7.1 Current Site Conditions 34
7.2 Near-Term Management Recommendations 35
7.3 Long-Term Stewardship Recommendations 35

8.0 DEVIATIONS FROM THE ER RSOP 35

9.0 RCRA UNIT CLOSURE 36

10.0 WASTE MANAGEMENT 36

11.0 SITE RECLAMATION 36

12.0 NO LONGER REPRESENTATIVE SAMPLING LOCATIONS 36

13.0 DATA QUALITY ASSESSMENT 36

13.1 Data Quality Assessment Process 37
13.2 Verification and Validation of Results 38
13.3 Summary of Data Quality 55

14.0 CONCLUSION 55

15.0 REFERENCES 55

LIST OF FIGURES

Figure 1 IHSS Group 900-12 Location 2
Figure 2 IHSS Group 900-12 Pre-Accelerated Action Soil Sampling Locations and Results 9
Figure 3 IHSS Group 900-12 Characterization Sampling Locations and Results 11
Figure 4 IHSS Group 900-12 Confirmation Sampling Locations and Results 28
Figure 5 IHSS Group 900-12 Trenches T-5, T-6 and T-8 Residual Soil Concentrations 30
Figure 6 IHSS Group 900-12 Trenches T-9a, T-9b, T-10 and T-11 Residual Soil Concentrations 31

LIST OF TABLES

Table 1 IHSS Group 900-12 Sampling and Analysis Specifications and Deviations From the IASAP Addendum 4
Table 2 IHSS Group 900-12 Sampling and Analysis Summary 8
Table 3 IHSS Group 900-12Accelerated Action Soil Characterization Data 12
Table 4 IHSS Group 900-12 Surface Soil Data Summary Statistics 21
Table 5 IHSS Group 900-12 Subsurface Soil Data Summary Statistics 22
Table 6 RFCA Sums of Ratios Based on Characterization Sampling. Surface Radionuclide Soil Activities 24
Table 7 RFCA Sums of Ratios Based on Characterization Sampling, Surface Non-Radionuclide Concentrations 24
Table 8 Dates of Accelerated Action Activities 25
Table 9 IHSS Group 900-12 Confirmation Soil Sampling Data 27
Table 10 RFCA Sums of Ratios Based on Confirmation Sampling, Surface Radionuclide Soil Concentrations 29
Table 11 No Longer Representative Sampling Locations and Intervals 36
Table 12 LCS Summary 39
Table 13 LCS Evaluation Summary 41
Table 14 Surrogate Recovery Summary 44
Table 15 Field Blank Summary 45
Table 16 Sample MS Evaluation Summary 45
Table 17 Sample MSD Evaluation Summary 48
Table 18 Field Duplicate Sample Frequency Summary 51
Table 19 RPD Evaluation Summary 52
Table 20 Validation and Verification Summary 54

LIST OF APPENDICES

Appendix A – Correspondence
Appendix B – Project Photographs

ENCLOSURE

Compact Disc Containing Standardized Real and Quality Control Accelerated Action Data

3

ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
Am	americium
AR	Administrative Record
bgs	below ground surface
BZ	Buffer Zone
BZSAP	Buffer Zone Sampling and Analysis Plan
CAS	Chemical Abstracts Service
CD	compact disc
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
ft	feet
FY	Fiscal Year
HPGe	high-purity germanium
HRR	Historical Release Report
IA	Industrial Area
IHSS	Individual Hazardous Substance Site
IMP	Integrated Monitoring Plan
K-H	Kaiser-Hill Company, L.L.C.
LCS	laboratory control sample
MDL	method detection limit
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
nCi/g	nanocurie per gram
NFAA	no further accelerated action
NLR	no longer representative
PARCCS	precision, accuracy, representativeness, completeness, comparability and sensitivity
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
pCi/L	picocuries per liter

POE	Point of Evaluation
Pu	plutonium
QC	quality control
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RI/FS	Remedial Investigation/Feasibility Study
RL	reporting limit
RPD	relative percent difference
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SBD	sample beginning depth
SD	standard deviation
SED	sample end depth
SID	South Interceptor Ditch
Site	Rocky Flats Environmental Technology Site
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
SWD	Soil Water Database
U	uranium
V&V	verification and validation
VOC	volatile organic compound
WRW	wildlife refuge worker

EXECUTIVE SUMMARY

This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 900-12, which is located at the Rocky Flats Environmental Technology Site (RFETS or Site). This IHSS Group consists of seven trenches (Trenches T-5, T-6, T-8, T-9a, T-9b, T-10 and T-11). Other trenches in the East Trenches area, including Trenches T-3, T-4, T-7, T-12 and T-13, will be addressed in updates to the Historical Release Report.

Activities were planned and executed in accordance with the Buffer Zone (BZ) Sampling and Analysis Plan (SAP) (BZSAP), BZSAP Addendum #BZ-04-02, the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol for Routine Soil Remediation (ER RSOP), and a RFETS ER Regulatory Contact Record dated September 2, 2004. Notification of the planned characterization and removal activities was provided in ER RSOP Notification #04-13.

Activities were conducted between January 28, 2004, and September 28, 2004, and included the following:

- Characterization of surface and near-surface soil in the seven trenches; and
- Removal of soil in conformance with RFCA requirements.

Characterization sampling results indicated that some contaminant concentrations and activities exceeded wildlife refuge worker (WRW) action levels (ALs) in Trenches T-6, T-8 and T-9a, primarily in the fill material overlying the trench contents. In Trench T-6, plutonium-239/240 activities exceeded the WRW AL at 0 to 0.5 foot (ft), 0.5 to 2.5 feet (ft), and 2.5 to 4.5 ft below ground surface (bgs). In Trench T-8, plutonium-239/240 activities exceeded the WRW AL at 0 to 0.5 ft, 0.5 to 2.5 ft, 2.5 to 4.5 ft, and 4.5 to 6.5 ft bgs. Americium-241 activities exceeded the WRW AL at 0.5 to 2.5 ft and 2.5 to 4.5 ft bgs. In Trench T-9a, the benzo(a)pyrene concentration exceeded the WRW AL at 0.5 to 2.5 ft bgs

Elevated plutonium-239/240 and americium-241 activities resulted in soil removal and subsequent confirmation sampling. Confirmation sampling results indicate that the plutonium activity at one subsurface location exceeds the WRW AL (50 picocuries per gram); however, the activity is considerably less than 1 nanocurie per gram at a depth greater than 3 ft bgs. Based on RFCA and the Subsurface Soil Risk Screen (SSRS), additional soil removal at this and other locations with residual contamination is not required. In addition, results of the data quality assessment confirmed that the data collected and used were adequate for decision-making.

Removal activities were consistent with and contributed to the ER RSOP overall long-term remedial action objectives for RFETS soil. The removal of contaminated soil contributed to the protection of human health and the environment, because potential sources of contamination were removed. These actions also minimized the need for long-term maintenance and institutional or engineering controls. In addition, best management practices were used to prevent the spread of contamination (for example, erosion and dust

controls during the accelerated action). Clean fill was brought to the project site and used to backfill excavations and prevent large-scale ponding of precipitation.

No IHSS Group-specific, near-term management techniques, including engineered controls and environmental monitoring, are required because of environmental conditions remaining in IHSS Group 900-12. Excavation with the IHSS Group will continue to be controlled through the Site Soil Disturbance Permit process. Access will be restricted to minimize disturbance to newly revegetated areas. Site access and security controls and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

The presence of residual radionuclides, metals, volatile organic compounds, semivolatile organic compounds, and polychlorinated biphenyls in soil will be further evaluated in the Sitewide Comprehensive Risk Assessment (CRA), which is part of the Remedial Investigation/Feasibility Study (RI/FS) that will be conducted for the Site. Potential ecological risk will be evaluated in the Accelerated Action Ecological Screening Evaluation and the ecological risk assessment portion of the Sitewide CRA. The need for and extent of any more general, long-term stewardship activities will also be evaluated in the RI/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Decision/Record of Decision and any post-RFCA agreement.

No long-term stewardship activities are recommended for IHSS Group 900-12 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS Group 900-12.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record file. The specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy.

Approval of this Closeout Report constitutes regulatory agency concurrence that this IHSS Group is a No Further Acclerated Action (NFAA) site. An NFAA decision is justified based on the following:

- NFAA based on soil data results;
- NFAA based on the SSRS; and
- NFAA based on the Stewardship Evaluation.

This information and NFAA determination will be documented in the Fiscal Year 2005 Historical Release Report.

1.0 INTRODUCTION

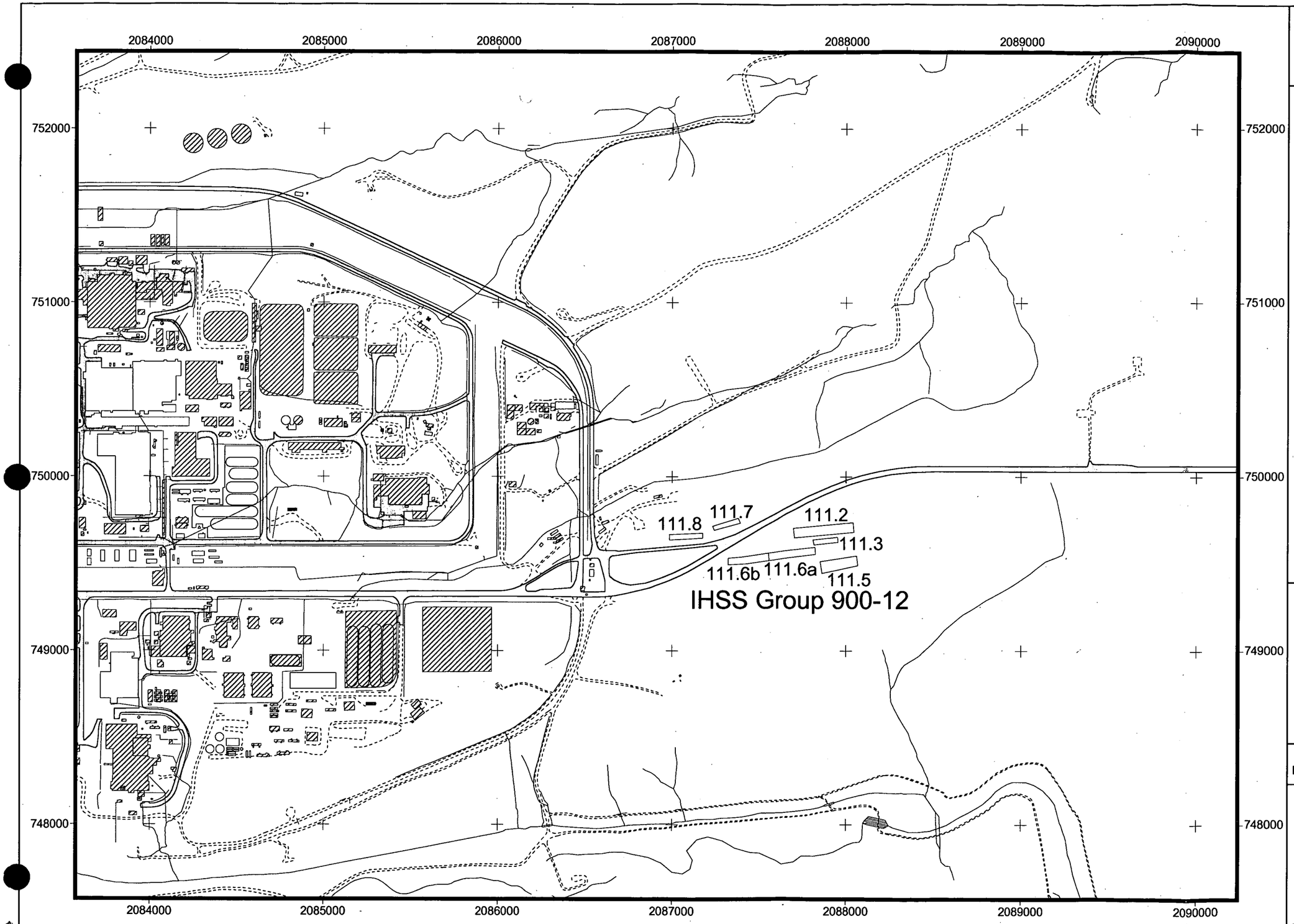
This Closeout Report summarizes the characterization and accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 900-12 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. This IHSS Group, which is part of the East Trenches area, consists of seven trenches: T-5 (IHSS NE-111.2), T-6 (IHSS NE-111.3), T-8 (IHSS NE-111.5), T-9a (IHSS NE-111.6a), T-9b (IHSS NE-111.6b), T-10 (IHSS NE-111.7), and T-11 (IHSS NE-111.8). The location of IHSS Group 900-12 is shown on Figure 1. This closeout report addresses only the aforementioned IHSSs. Other trenches in the East Trenches area, including T-3, T-4 and T-7, will be addressed in updates to the Historical Release Report (HRR).

Accelerated action activities were planned and executed in accordance with the Buffer Zone (BZ) Sampling and Analysis Plan (SAP) (BZSAP) (DOE 2002a), BZSAP Addendum #BZ-04-02 (DOE 2003a), Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003b), and an RFETS ER Regulatory Contact Record dated September 2, 2004 (Appendix A). Notification of planned activities was provided in ER RSOP Notification #04-13 (DOE 2004), which was approved by the U.S. Environmental Protection Agency (EPA), Region VIII, on June 17, 2004 (EPA 2004).

This report contains the information necessary to demonstrate attainment of cleanup objectives and closure of IHSS Group 900-12, including:

- Site characterization information
  - Description of site characterization activities, and
  - Site characterization data, including data tables and maps;
- Site accelerated action information
  - Description of the accelerated action,
  - Map of the actual remediation area, including dates and durations of specific remedial activities, and
  - Photographs documenting site characterization, remediation, and reclamation activities;
- Confirmation sampling data, including data tables and location maps, as well as a comparison of the confirmation data to applicable cleanup goals;
- Description of deviations from the ER RSOP;
- Description of the Subsurface Soil Risk Screen (SSRS);

Figure 1
IHSS Group 900-12 Location



KEY

- IHSS Group
- Demolished building
- Standing building
- Paved road
- Dirt road
- Stream/ditch

N
W E
S

200 0 200 400 600 800 Feet

Scale = 1:6,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS

Prepared for: KAISER•HILL COMPANY

File:W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr

Date: 12/15/04

- Description of near-term stewardship actions and long-term stewardship recommendations;
- Disposition of wastes;
- Site reclamation;
- Table of no longer representative (NLR) sampling locations that have been remediated. These data will be used to mark database records so they are not used in the sitewide Comprehensive Risk Assessment (CRA) or other Site analyses; and
- Data quality assessment (DQA), including comparison of confirmation data with project data quality objectives (DQOs).

Approval of this Closeout Report constitutes regulatory agency concurrence that this IHSS Group is a no further accelerated action (NFAA) site. This information and NFAA determination will be documented in the Fiscal Year (FY) 2005 (05) HRR.

2.0 SITE CHARACTERIZATION

IHSS Group 900-12 characterization information consists of historical knowledge and analytical data. Historical information for the Group was derived from previous studies (DOE 1992-2003, 1996, 2001, 2002a, 2003a and 2004) and is summarized in Section 2.1. Analytical data for IHSS Group 900-12 (pre-accelerated action and accelerated action data) are summarized in Sections 2.1 and 2.2, respectively. A compact disc (CD) that contains the accelerated action data set, including real and quality control (QC) data, is enclosed with this report.

Accelerated action analytical data were collected in accordance with BZSAP Addendum #BZ-04-02 (DOE 2003a) and an RFETS ER Regulatory Contact Record dated September 2, 2004 (Appendix A). Soil from Trenches T-6, T-8, T-9a and T-9b were collected from multiple depths and analyzed for multiple analytes because limited historical data were available. Soil from Trenches T-5, T-10 and T-11 were collected only from the surface and near-surface (0.0 to 2.5 feet [ft]) because sufficient data existed for deeper soil. This soil was only analyzed for radionuclides because they are the only identified contaminants of concern (COCs). Sampling and analysis specifications, including media sampled, depth intervals and analytes, for the project are presented in Table 1. This table includes characterization and confirmation sampling and analysis specifications. Deviations from the BZSAP Addendum are also presented and explained in Table 1. A summary of all project sampling and analysis (characterization and confirmation) is presented in Table 2.

Table 1
IHSS Group 900-12 Sampling and Analysis Specifications and Deviations From the IASAP Addendum

Trench	Sampling Location	Planned Northing	Planned Easting	Actual Northing	Actual Easting	Actual Media	Actual Depth Interval (ft)	Actual Analyte	Comments
T-5	CZ41-008	749687.941	2087876.830	749687.891	2087876.886	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides	Biased characterization sampling location. No significant change in location, depth or analytes.
T-5	CZ41-009	749690.479	2087932.656	749690.549	2087932.689	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides	Biased characterization sampling location. No significant change in location, depth or analytes.
T-6	CZ41-001	749637.905	2087861.492	749637.875	2087861.490	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5 2.5 – 4.5 4.5 – 6.5 6.5 – 8.5 8.5 – 10.5	Radionuclides Metals SVOCs VOCs (except A interval) PCBs	Biased characterization sampling location. No significant change in location, depth or analytes.
T-6	DA41-001	749643.114	2087965.658	749643.128	2087965.619	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5 2.5 – 4.5 4.5 – 6.5 6.5 – 8.5 8.5 – 10.5 10.5 – 12.0 12.0 – 13.5	Radionuclides Metals SVOCs VOCs (except A interval) PCBs	Biased characterization sampling location. No significant change in location or analytes. Added last 2 intervals to reach native soil.
T-6	DA41-007	NA	NA	749643.128	2087965.619	Subsurface Soil	3.8 – 4.3	Radionuclides	Biased confirmation sampling location; bottom of excavation.
T-6	DA41-008	NA	NA	749649.881	2087966.190	Subsurface Soil	1.0 – 1.5	Radionuclides	Biased confirmation sampling location; north side wall.
T-6	DA41-009	NA	NA	749639.230	2087982.670	Subsurface Soil	1.0 – 1.5	Radionuclides	Biased confirmation sampling location; east side wall.
T-6	DA41-010	NA	NA	749626.278	2087965.228	Subsurface Soil	1.0 – 1.5	Radionuclides	Biased confirmation sampling location; south side wall.
T-6	DA41-011	NA	NA	749632.586	2087871.370	Subsurface Soil	1.0 – 1.5	Radionuclides	Biased confirmation sampling location; west side wall.

Trench	Sampling Location	Planned Northing	Planned Easting	Actual Northing	Actual Easting	Actual Media	Actual Depth Interval (ft)	Actual Analyte	Comments
T-8	CZ40-003	749520.718	2087930.502	749520.727	2087930.489	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5 2.5 – 4.5 4.5 – 6.5 6.5 – 8.5 8.5 – 10.5 10.5 – 12.5 12.5 – 13.5	Radionuclides Metals SVOCs VOCs (except A interval) PCBs	Biased characterization sampling location. No significant change in location or analytes. Added last 2 intervals to reach native soil.
T-8	CZ40-004	749508.999	2087864.096	749508.996	2087864.020	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5 2.5 – 4.5 4.5 – 6.5 6.5 – 8.5 8.5 – 10.5 10.5 – 12.5 12.5 – 14.5 14.5 – 15.5	Radionuclides Metals SVOCs VOCs (except A interval) PCBs	Biased characterization sampling location. No significant change in location or analytes. Added last 3 intervals to reach native soil.
T-8	CZ40-010	NA	NA	749520.739	2087916.849	Subsurface Soil	0.5 – 2.5	Radionuclides	Biased confirmation sampling location; bottom of excavation.
T-8	CZ40-011	NA	NA	749507.926	2087924.453	Subsurface Soil	0.5 – 2.5	Radionuclides	Biased confirmation sampling location; south side wall.
T-8	DA40-000	NA	NA	749505.126	2087943.713	Subsurface Soil	0.5 – 2.5	Radionuclides	Biased confirmation sampling location; south side wall.
T-8	DA40-002	NA	NA	749525.286	2087945.180	Subsurface Soil	0.5 – 2.5	Radionuclides	Biased confirmation sampling location; north side wall.
T-8	DA41-002	NA	NA	749520.330	2087931.085	Subsurface Soil	3.0 – 3.5	Radionuclides	Biased confirmation sampling location; bottom of excavation.
T-8	DA41-003	NA	NA	749523.545	2087931.170	Subsurface Soil	1.0 – 1.5	Radionuclides	Biased confirmation sampling location; north side wall.
T-8	DA41-004	NA	NA	749519.860	2087991.434	Subsurface Soil	1.0 – 1.5	Radionuclides	Biased confirmation sampling location; east side wall.
T-8	DA41-006	NA	NA	749507.642	2087873.537	Subsurface Soil	1.0 – 1.5	Radionuclides	Biased confirmation sampling location; west side wall.

Trench	Sampling Location	Planned Northing	Planned Easting	Actual Northing	Actual Easting	Actual Media	Actual Depth Interval (ft)	Actual Analyte	Comments
T9a	CY40-002	749559.780	2087619.304	749559.777	2087619.292	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5 2.5 – 4.5 4.5 – 6.5 6.5 – 8.0 8.0 – 10.0	Radionuclides Metals SVOCs VOCs (except A interval) PCBs	Biased characterization sampling location. No significant change in location or analytes. Had partial recovery at 5th interval.
T-9a	CZ41-002	NA	NA	749578.072	2087749.076	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides Metals SVOCs VOCs (B interval only) PCBs	Characterization sampling location added after BZSAP Addendum #BZ-04-02 was approved. Sampled and analyzed per ER RSOP Notification #04-13.
T-9b	CX40-003	749538.946	2087498.205	749538.947	2087498.210	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5 2.5 – 4.5 4.5 – 6.5 6.5 – 8.5 8.5 – 10.5 10.5 – 12.5 12.5 – 14.5	Radionuclides Metals SVOCs VOCs (except A interval) PCBs	Biased characterization sampling location. No significant change in location or analytes. Added last 2 intervals to reach native soil.
T-9b	CX40-004	749524.709	2087422.668	749524.624	2087422.690	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5 2.5 – 4.5 4.5 – 6.5 6.5 – 8.5 8.5 – 10.5	Radionuclides Metals SVOCs VOCs (except A interval) PCBs	Biased characterization sampling location. No significant change in location, depth or analytes.
T-10	CW41-007	749718.640	2087267.611	749718.660	2087267.567	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides	Biased characterization sampling location. No significant change in location, depth or analytes.
T-10	CW41-008	749725.278	2087333.987	749725.290	2087333.945	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides	Biased characterization sampling location. No significant change in location, depth or analytes.
T-11	CV41-014	749668.858	2087133.200	749668.825	2087133.202	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides	Biased characterization sampling location. No significant change in location, depth or analytes.

Trench	Sampling Location	Planned Northing	Planned Easting	Actual Northing	Actual Easting	Actual Media	Actual Depth Interval (ft)	Actual Analyte	Comments
T-11	CV41-015	749640.649	2086975.558	749640.645	2086975.587	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides	Biased characterization sampling location. No significant change in location, depth or analytes.
T-11	CV41-016	749653.924	2087055.209	749653.981	2087055.271	Surface Soil Subsurface Soil	0.0 – 0.5 0.5 – 2.5	Radionuclides	Biased characterization sampling location. No significant change in location, depth or analytes.

PCB- Polychlorinated biphenyl
SVOC – Semi-volatile organic compound
VOC – Volatile organic compound
NA – not applicable

Table 2
IHSS Group 900-12 Sampling and Analysis Summary

Category	Planned Total	Actual Total
Number of Sampling Locations	7	28
Number of Samples	42	80
Number of Radionuclide Analyses	42	80
Number of Metal Analyses	42	53
Number of VOC Analyses	35	45
Number of SVOC Analyses	42	53
Number of PCB Analyses	42	53

2.1 East Trenches, Historical Information and Data

The East Trenches (T-3 through T-13) are variable in length, with the average length being approximately 250 ft. The trenches are approximately 10 ft deep and have a two-foot soil cover. The trenches were used during the period from July 29, 1954, through August 14, 1968, based on aerial photographs. The exact dates of operation are unknown. To date, no documentation has been found that records the timeframe during which any particular trench was receiving waste. Similarly, none of the interviewees for the HRR (DOE 1992 - 2003) were knowledgeable on dates of operation of individual trenches.

The East Trenches were used primarily for the disposal of sanitary wastewater treatment plant sludge. The sludge consisted primarily of concentrated organic matter typically present in sanitary wastewater treatment plant sludge. Additional material, such as flattened drums that had contained radioactively contaminated oil, was disposed in Trenches T-3 and T-4 and potentially in T-5 through T-11. Other materials were disposed in Trenches T-4, T-9 and T-11, including potentially radioactively contaminated asphalt planking (approximately 130,000 square feet) from the re-design of Solar Evaporation Pond 207A in T-4 and T-11 in 1963, and scrap metal and miscellaneous debris in T-9. Also, an employee recalled that laboratory waste may have been disposed of in Trench T-13. In addition, miscellaneous debris is known or suspected in all the trenches.

Pre-accelerated action data are presented on Figure 2. Only data greater than background means plus two standard deviations (SDs) (for radionuclides and metals) or method detection limits (MDLs) (for organic compounds) are presented. The data show that soil from one location in Trench T-8 and one location in Trench T-10 had contaminant concentrations or activities greater than the wildlife refuge worker (WRW) ALs. In Trench T-8, at Sampling Location 12795, one americium (Am)-241 activity, two plutonium (Pu)-239/240 activities, and one chromium concentration exceeded WRW ALs. In Trench T-10, at Sampling Location 10395, two benzo(a)pyrenne concentrations exceeded the WRW AL. All exceedances occurred at depths greater than 3 ft below ground surface (bgs), and Pu-239/240 and Am-241 activities were considerably less than 1 nanocurie per gram (nCi/g). Therefore, exceedances did not require remediation (refer to Section 6.0). The purpose of these data was to help define potential COCs and accelerated action sampling locations.

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 05-RF-00239; KLW-021-05)

Closeout Report IHSS Group 900-12 East Trenches

T-5 (IHSS NE-111.2), T-6 (IHSS NE-111/3, T-8 (IHSS NE-111.5), T9a (IHSS 111.6a), T-9b (IHSS NE-111.6b), T-10 (IHSS NE-111.7), and T-11 (IHSS NE-111.8)

February 2005

Figure 2:

IHSS Group 900-12 Pre-Accelerated Action Soil Sampling Locations and Results

File: W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr

December 2, 2004

CERCLA Administrative Record Document, BZ-Z-000813

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

16

Sums of ratios (SORs) were not calculated for historical soil radionuclide and non-radionuclide concentrations because the historical soil samples were generally collected at 3 ft bgs or greater (at 23 out of 24 historical sampling locations). SORs are calculated for radionuclide sample data collected at 0 to 3 ft bgs.

2.2 Accelerated Action Characterization Data

Accelerated action soil sampling results for IHSS Group 900-12 are presented on Figure 3 and in Table 3. Only results greater than background means plus two SDs or reporting limits (RLs) are shown. WRW AL exceedances are shown in bold in Table 3 and in red on Figure 3. Pu-239/240 and uranium (U)-234 activities based on high-purity germanium (HPGe) results (derived from Am-241 and U-238 gamma spectroscopy results, respectively) are shown in Table 3 in italics. Summary statistics for the project analytical results (characterization and confirmation analysis) are presented in Tables 4 and 5 for surface soil and subsurface soil, respectively. All project data, retrieved from the RFETS Soil Water Database (SWD) on December 13, 2004, are provided on the enclosed CD. The CD contains standardized real and QC data (Chemical Abstracts Service [CAS] numbers, analyte names, and units).

Accelerated action data indicate WRW AL exceedances were present in soil collected from one sampling location at each of three trenches. At the Trench T-6 location, Pu-239/240 activities exceeded the WRW AL at 0 to 0.5 ft, 0.5 to 2.5 ft, and 2.5 to 4.5 ft bgs. At the Trench T-8 location, Pu-239/240 activities exceeded the WRW AL at 0 to 0.5 ft, 0.5 to 2.5 ft, 2.5 to 4.5 ft, and 4.5 to 6.5 ft bgs. Am-241 activities exceeded the WRW AL at 0.5 to 2.5 ft and 2.5 to 4.5 ft bgs. At the Trench T-9a location, the benzo(a)pyrene concentration exceeded the WRW AL at 0.5 to 2.5 ft below bgs. All Pu-239/240 and Am-241 activities in soil deeper than 3 ft bgs were considerably less than 1 nCi/g.

Elevated Pu-239/240 and Am-241 activities resulted in soil removal to 3 ft bgs (Section 3.0) and subsequent confirmation sampling (Section 4.0). The elevated benzo(a)pyrene concentration did not require soil removal based on RFCA and the SSRS (Section 6.0).

2.3 Sums of Ratios

RFCA SORs were calculated for the IHSS Group 900-12 sampling locations based on accelerated action analytical data for the COCs and the WRW ALs. Surface soil (0 - 2.5 ft) SORs were calculated for the radionuclides of concern (Am-241, Pu-239/240, and U-234, U-235, and U-238), and surface soil (0 - 0.5 ft) SORs were calculated for the non-radionuclides of concern (metals, VOCs and SVOCs excluding arsenic, aluminum, iron, manganese, and polynuclear aromatic hydrocarbons). Subsurface non-radionuclide soil concentrations are evaluated as part of the SSRS in Section 6.0.

SORs for radionuclides were calculated for all locations with analytical results greater than background means plus two SDs. Pu-239/240 activities are derived from Am-241 activities when Am-241 is measured using HPGe detection analysis. SORs for radionuclides, within the first 2.5 ft below grade, are presented in Table 6. As shown, SORs for radionuclides in surface soil were greater than 1 at 3 sampling intervals. These intervals had radionuclide activities greater than the WRW ALs, however, both intervals were remediated (refer to Sections 3.0 and 4.0).

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 05-RF-00239; KLW-021-05)

Closeout Report IHSS Group 900-12
East Trenches

**T-5 (IHSS NE-111.2), T-6 (IHSS NE-111/3,
T-8 (IHSS NE-111.5), T9a (IHSS 111.6a),
T-9b (IHSS NE-111.6b), T-10 (IHSS NE-111.7),
and T-11 (IHSS NE-111.8)**

February 2005

Figure 3:

IHSS Group 900-12 Characterization Sampling Locations and Results

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December 2, 2004

CERCLA Administrative Record Document, BZ-Z-000813

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

18

Table 3
IHSS Group 900-12Accelerated Action Soil Characterization Data

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CV41-014	749668.825	2087133.202	0.0	0.5	Americium-241	0.499	NA	0.023	76.0	pCi/g
CV41-014	*749668.825*	*2087133.202*	*0.0*	*0.5*	*Plutonium-239/240*	*2.843*	NA	*0.066*	*50.0*	*pCi/g*
CV41-014	749668.825	2087133.202	0.0	0.5	Uranium-235	0.120	NA	0.094	8.0	pCi/g
CV41-014	749668.825	2087133.202	0.5	2.5	Uranium-235	0.130	NA	0.120	8.0	pCi/g
CV41-015	749640.645	2086975.587	0.0	0.5	Americium-241	0.474	NA	0.023	76.0	pCi/g
CV41-015	*749640.645*	*2086975.587*	*0.0*	*0.5*	*Plutonium-239/240*	*2.701*	NA	*0.066*	*50.0*	*pCi/g*
CV41-015	749640.645	2086975.587	0.5	2.5	Uranium-238	2.241	NA	1.490	351.0	pCi/g
CV41-016	749653.981	2087055.271	0.0	0.5	Uranium-235	0.111	NA	0.094	8.0	pCi/g
CV41-016	*749653.981*	*2087055.271*	*0.5*	*2.5*	*Uranium-234*	*3.481*	NA	*2.640*	*300.0*	*pCi/g*
CV41-016	749653.981	2087055.271	0.5	2.5	Uranium-235	0.235	NA	0.120	8.0	pCi/g
CV41-016	749653.981	2087055.271	0.5	2.5	Uranium-238	3.481	NA	1.490	351.0	pCi/g
CW41-007	749718.660	2087267.567	0.0	0.5	Americium-241	1.538	NA	0.023	76.0	pCi/g
CW41-007	*749718.660*	*2087267.567*	*0.0*	*0.5*	*Plutonium-239/240*	*8.767*	NA	*0.066*	*50.0*	*pCi/g*
CW41-007	*749718.660*	*2087267.567*	*0.0*	*0.5*	*Uranium-234*	*3.076*	NA	*2.253*	*300.0*	*pCi/g*
CW41-007	749718.660	2087267.567	0.0	0.5	Uranium-235	0.185	NA	0.094	8.0	pCi/g
CW41-007	749718.660	2087267.567	0.0	0.5	Uranium-238	3.076	NA	2.000	351.0	pCi/g
CW41-007	749718.660	2087267.567	0.5	2.5	Uranium-235	0.126	NA	0.120	8.0	pCi/g
CW41-008	749725.290	2087333.945	0.0	0.5	Americium-241	2.466	NA	0.023	76.0	pCi/g
CW41-008	*749725.290*	*2087333.945*	*0.0*	*0.5*	*Plutonium-239/240*	*14.056*	NA	*0.066*	*50.0*	*pCi/g*
CW41-008	749725.290	2087333.945	0.5	2.5	Americium-241	0.318	NA	0.020	76.0	pCi/g
CW41-008	*749725.290*	*2087333.945*	*0.5*	*2.5*	*Plutonium-239/240*	*1.811*	NA	*0.020*	*50.0*	*pCi/g*
CX40-003	749538.946	2087498.205	0.0	0.5	4,6-Dinitro-2-methylphenol	390.000	180.000	-	1020000.0	ug/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Aluminum	18000.000	NA	16902.000	228000.0	mg/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Benzo(a)anthracene	39.000	27.000	-	34900.0	ug/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Benzo(a)pyrene	92.000	43.000	-	3490.0	ug/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Benzo(b)fluoranthene	40.000	31.000	-	34900.0	ug/kg

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CX40-003	749538.946	2087498.205	0.0	0.5	Chromium	20.000	NA	16.990	268.0	mg/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Chrysene	87.000	30.000	-	3490000.0	ug/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Lithium	18.000	NA	11.550	20400.0	mg/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Nickel	21.000	NA	14.910	20400.0	mg/kg
CX40-003	749538.946	2087498.205	0.0	0.5	Strontium	130.000	NA	48.940	613000.0	mg/kg
CX40-003	*749538.946*	*2087498.205*	*0.0*	*0.5*	*Uranium-234*	*4.036*	NA	*2.253*	*300.0*	*pCi/g*
CX40-003	749538.946	2087498.205	0.0	0.5	Uranium-235	0.208	NA	0.094	8.0	pCi/g
CX40-003	749538.946	2087498.205	0.0	0.5	Uranium-238	4.036	NA	2.000	351.0	pCi/g
CX40-003	749538.946	2087498.205	0.5	2.5	Benzo(a)pyrene	170.000	40.000	-	3490.0	ug/kg
CX40-003	749538.946	2087498.205	0.5	2.5	Chrysene	180.000	28.000	-	3490000.0	ug/kg
CX40-003	749538.946	2087498.205	0.5	2.5	Pyrene	380.000	130.000	-	22100000.0	ug/kg
CX40-003	*749538.946*	*2087498.205*	*0.5*	*2.5*	*Uranium-234*	*3.666*	NA	*2.640*	*300.0*	*pCi/g*
CX40-003	749538.946	2087498.205	0.5	2.5	Uranium-235	0.161	NA	0.120	8.0	pCi/g
CX40-003	749538.946	2087498.205	0.5	2.5	Uranium-238	3.666	NA	1.490	351.0	pCi/g
CX40-003	749538.946	2087498.205	2.5	4.5	Benzo(a)pyrene	85.000	41.000	-	3490.0	ug/kg
CX40-003	749538.946	2087498.205	2.5	4.5	Chrysene	84.000	28.000	-	3490000.0	ug/kg
CX40-003	749538.946	2087498.205	2.5	4.5	Indeno(1,2,3-cd)pyrene	41.000	23.000	-	34900.0	ug/kg
CX40-003	749538.946	2087498.205	2.5	4.5	Pyrene	150.000	140.000	-	22100000.0	ug/kg
CX40-003	749538.946	2087498.205	4.5	6.5	Benzo(a)pyrene	53.000	41.000	-	3490.0	ug/kg
CX40-003	749538.946	2087498.205	4.5	6.5	Chrysene	57.000	28.000	-	3490000.0	ug/kg
CX40-003	749538.946	2087498.205	4.5	6.5	Uranium-235	0.158	NA	0.120	8.0	pCi/g
CX40-003	749538.946	2087498.205	8.5	10.5	Chromium	82.000	NA	68.270	268.0	mg/kg
CX40-003	749538.946	2087498.205	12.5	14.5	Uranium-235	0.137	NA	0.120	8.0	pCi/g
CX40-004	749524.709	2087422.668	0.0	0.5	Aluminum	25000.000	NA	16902.000	228000.0	mg/kg
CX40-004	749524.709	2087422.668	0.0	0.5	Americium-241	6.795	NA	0.023	76.0	pCi/g
CX40-004	749524.709	2087422.668	0.0	0.5	Aroclor-1254	180.000	5.100	-	12400.0	ug/kg
CX40-004	749524.709	2087422.668	0.0	0.5	Barium	200.000	NA	141.260	26400.0	mg/kg
CX40-004	749524.709	2087422.668	0.0	0.5	Chromium	19.000	NA	16.990	268.0	mg/kg
CX40-004	749524.709	2087422.668	0.0	0.5	Lithium	20.000	NA	11.550	20400.0	mg/kg

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CX40-004	749524.709	2087422.668	0.0	0.5	Nickel	23.000	NA	14.910	20400.0	mg/kg
CX40-004	*749524.709*	*2087422.668*	*0.0*	*0.5*	*Plutonium-239/240*	*38.732*	NA	*0.066*	*50.0*	*pCi/g*
CX40-004	749524.709	2087422.668	0.0	0.5	Strontium	160.000	NA	48.940	613000.0	mg/kg
CX40-004	749524.709	2087422.668	0.0	0.5	Uranium-235	0.109	NA	0.094	8.0	pCi/g
CX40-004	749524.709	2087422.668	2.5	4.5	Strontium	230.000	NA	211.380	613000.0	mg/kg
CX40-004	749524.709	2087422.668	4.5	6.5	Americium-241	0.168	NA	0.020	76.0	pCi/g
CX40-004	*749524.709*	*2087422.668*	*4.5*	*6.5*	*Plutonium-239/240*	*0.955*	NA	*0.020*	*50.0*	*pCi/g*
CX40-004	749524.709	2087422.668	6.5	8.5	Uranium-238	1.772	NA	1.490	351.0	pCi/g
CY40-002	749559.777	2087619.292	0.0	0.5	Americium-241	1.779	NA	0.023	76.0	pCi/g
CY40-002	749559.777	2087619.292	0.0	0.5	Aroclor-1254	3000.000	95.000	-	12400.0	ug/kg
CY40-002	749559.777	2087619.292	0.0	0.5	Benzo(a)pyrene	48.000	43.000	-	3490.0	ug/kg
CY40-002	749559.777	2087619.292	0.0	0.5	Chrysene	39.000	30.000	-	3490000.0	ug/kg
CY40-002	749559.777	2087619.292	0.0	0.5	Fluoranthene	69.000	24.000	-	27200000.0	ug/kg
CY40-002	749559.777	2087619.292	0.0	0.5	Mercury	0.250	NA	0.134	25200.0	mg/kg
CY40-002	*749559.777*	*2087619.292*	*0.0*	*0.5*	*Plutonium-239/240*	*10.140*	NA	*0.066*	*50.0*	*pCi/g*
CY40-002	*749559.777*	*2087619.292*	*0.0*	*0.5*	*Uranium-234*	*27.810*	NA	*2.253*	*300.0*	*pCi/g*
CY40-002	749559.777	2087619.292	0.0	0.5	Uranium-235	3.265	NA	0.094	8.0	pCi/g
CY40-002	749559.777	2087619.292	0.0	0.5	Uranium-238	27.810	NA	2.000	351.0	pCi/g
CY40-002	749559.777	2087619.292	0.5	2.5	2-Methylnaphthalene	83000.000	3600.000	-	20400000.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Acenaphthene	24000.000	3500.000	-	40800000.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Americium-241	0.760	NA	0.020	76.0	pCi/g
CY40-002	749559.777	2087619.292	0.5	2.5	Anthracene	8700.000	2700.000	-	204000000.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Aroclor-1254	730.000	25.000	-	12400.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Benzo(a)anthracene	5600.000	2800.000	-	34900.0	ug/kg
CY40-002	**749559.777**	**2087619.292**	**0.5**	**2.5**	**Benzo(a)pyrene**	**4700.000**	**4500.000**	-	**3490.0**	**ug/kg**
CY40-002	749559.777	2087619.292	0.5	2.5	Chrysene	11000.000	3100.000	-	3490000.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Dibenzofuran	7000.000	4100.000	-	2950000.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Fluoranthene	5200.000	2600.000	-	27200000.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Fluorene	7100.000	3800.000	-	40800000.0	ug/kg

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CY40-002	749559.777	2087619.292	0.5	2.5	n-Nitrosodiphenylamine	17000.000	3100.000	-	7810000.0	ug/kg
CY40-002	*749559.777*	*2087619.292*	*0.5*	*2.5*	*Plutonium-239/240*	*4.330*	NA	*0.020*	*50.0*	*pCi/g*
CY40-002	749559.777	2087619.292	0.5	2.5	Pyrene	36000.000	15000.000	-	22100000.0	ug/kg
CY40-002	749559.777	2087619.292	0.5	2.5	Uranium, Total	9.200	NA	3.040	2750.0	mg/kg
CY40-002	*749559.777*	*2087619.292*	*0.5*	*2.5*	*Uranium-234*	*14.620*	NA	*2.640*	*300.0*	*pCi/g*
CY40-002	749559.777	2087619.292	0.5	2.5	Uranium-235	1.483	NA	0.120	8.0	pCi/g
CY40-002	749559.777	2087619.292	0.5	2.5	Uranium-238	14.620	NA	1.490	351.0	pCi/g
CY40-002	749559.777	2087619.292	2.5	4.5	Aroclor-1254	210.000	4.700	-	12400.0	ug/kg
CY40-002	749559.777	2087619.292	2.5	4.5	Cadmium	1.800	NA	1.700	962.0	mg/kg
CY40-002	749559.777	2087619.292	2.5	4.5	Copper	180.000	NA	38.210	40900.0	mg/kg
CY40-002	749559.777	2087619.292	2.5	4.5	Lead	350.000	NA	24.970	1000.0	mg/kg
CY40-002	749559.777	2087619.292	2.5	4.5	Silver	42.000	NA	24.540	5110.0	mg/kg
CY40-002	749559.777	2087619.292	2.5	4.5	Uranium, Total	19.000	NA	3.040	2750.0	mg/kg
CY40-002	749559.777	2087619.292	2.5	4.5	Uranium-238	2.507	NA	1.490	351.0	pCi/g
CY40-002	749559.777	2087619.292	2.5	4.5	Zinc	550.000	NA	139.100	307000.0	mg/kg
CY40-002	749559.777	2087619.292	4.5	6.5	Aroclor-1254	35.000	4.600	-	12400.0	ug/kg
CY40-002	749559.777	2087619.292	4.5	6.5	Benzo(a)pyrene	48.000	41.000	-	3490.0	ug/kg
CY40-002	749559.777	2087619.292	4.5	6.5	Chrysene	75.000	29.000	-	3490000.0	ug/kg
CY40-002	749559.777	2087619.292	4.5	6.5	Fluoranthene	36.000	23.000	-	27200000.0	ug/kg
CY40-002	749559.777	2087619.292	4.5	6.5	Pyrene	170.000	140.000	-	22100000.0	ug/kg
CY40-002	*749559.777*	*2087619.292*	*4.5*	*6.5*	*Uranium-234*	*3.717*	NA	*2.640*	*300.0*	*pCi/g*
CY40-002	749559.777	2087619.292	4.5	6.5	Uranium-235	0.191	NA	0.120	8.0	pCi/g
CY40-002	749559.777	2087619.292	4.5	6.5	Uranium-238	3.717	NA	1.490	351.0	pCi/g
CY40-002	*749559.777*	*2087619.292*	*6.5*	*8.0*	*Uranium-234*	*5.497*	NA	*2.640*	*300.0*	*pCi/g*
CY40-002	749559.777	2087619.292	6.5	8.0	Uranium-235	0.210	NA	0.120	8.0	pCi/g
CY40-002	749559.777	2087619.292	6.5	8.0	Uranium-238	5.497	NA	1.490	351.0	pCi/g
CY40-002	749559.777	2087619.292	8.0	10.0	2-Methylnaphthalene	57.000	33.000	-	20400000.0	ug/kg
CY40-002	*749559.777*	*2087619.292*	*8.0*	*10.0*	*Uranium-234*	*3.547*	NA	*2.640*	*300.0*	*pCi/g*

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CY40-002	749559.777	2087619.292	8.0	10.0	Uranium-235	0.220	NA	0.120	8.0	pCi/g
CY40-002	749559.777	2087619.292	8.0	10.0	Uranium-238	3.547	NA	1.490	351.0	pCi/g
CZ40-003	749520.727	2087930.489	0.0	0.5	Americium-241	14.840	NA	0.023	76.0	pCi/g
CZ40-003	749520.727	2087930.489	0.0	0.5	Chromium	17.000	NA	16.990	268.0	mg/kg
CZ40-003	749520.727	2087930.489	0.0	0.5	Lithium	18.000	NA	11.550	20400.0	mg/kg
CZ40-003	749520.727	2087930.489	0.0	0.5	Nickel	15.000	NA	14.910	20400.0	mg/kg
CZ40-003	***749520.727***	***2087930.489***	***0.0***	***0.5***	***Plutonium-239/240***	***84.588***	NA	***0.066***	***50.0***	***pCi/g***
CZ40-003	749520.727	2087930.489	0.0	0.5	Strontium	95.000	NA	48.940	613000.0	mg/kg
CZ40-003	749520.727	2087930.489	0.0	0.5	Uranium-235	0.190	NA	0.094	8.0	pCi/g
CZ40-003	**749520.727**	**2087930.489**	**0.5**	**2.5**	**Americium-241**	**132.700**	NA	**0.020**	**76.0**	**pCi/g**
CZ40-003	749520.727	2087930.489	0.5	2.5	Aroclor-1254	46.000	4.800	-	12400.0	ug/kg
CZ40-003	749520.727	2087930.489	0.5	2.5	Benzo(a)anthracene	58.000	27.000	-	34900.0	ug/kg
CZ40-003	749520.727	2087930.489	0.5	2.5	Benzo(a)pyrene	64.000	44.000	-	3490.0	ug/kg
CZ40-003	749520.727	2087930.489	0.5	2.5	Benzo(b)fluoranthene	45.000	31.000	-	34900.0	ug/kg
CZ40-003	749520.727	2087930.489	0.5	2.5	Benzo(k)fluoranthene	57.000	35.000	-	349000.0	ug/kg
CZ40-003	749520.727	2087930.489	0.5	2.5	Cadmium	2.300	NA	1.700	962.0	mg/kg
CZ40-003	749520.727	2087930.489	0.5	2.5	Chrysene	70.000	30.000	-	3490000.0	ug/kg
CZ40-003	749520.727	2087930.489	0.5	2.5	Fluoranthene	130.000	25.000	-	27200000.0	ug/kg
CZ40-003	***749520.727***	***2087930.489***	***0.5***	***2.5***	***Plutonium-239/240***	***756.390***	NA	***0.020***	***50.0***	***pCi/g***
CZ40-003	749520.727	2087930.489	2.5	4.5	Aluminum	39000.000	NA	35373.170	228000.0	mg/kg
CZ40-003	**749520.727**	**2087930.489**	**2.5**	**4.5**	**Americium-241**	**122.000**	NA	**0.020**	**76.0**	**pCi/g**
CZ40-003	749520.727	2087930.489	2.5	4.5	Aroclor-1254	39.000	5.300	-	12400.0	ug/kg
CZ40-003	749520.727	2087930.489	2.5	4.5	Arsenic	14.000	NA	13.140	22.2	mg/kg
CZ40-003	749520.727	2087930.489	2.5	4.5	Cadmium	2.800	NA	1.700	962.0	mg/kg
CZ40-003	749520.727	2087930.489	2.5	4.5	Chrysene	45.000	33.000	-	3490000.0	ug/kg
CZ40-003	749520.727	2087930.489	2.5	4.5	Fluoranthene	65.000	27.000	-	27200000.0	ug/kg
CZ40-003	749520.727	2087930.489	2.5	4.5	Lithium	44.000	NA	34.660	20400.0	mg/kg
CZ40-003	***749520.727***	***2087930.489***	***2.5***	***4.5***	***Plutonium-239/240***	***695.400***	NA	***0.020***	***50.0***	***pCi/g***
CZ40-003	749520.727	2087930.489	2.5	4.5	Silver	25.000	NA	24.540	5110.0	mg/kg

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CZ40-003	749520.727	2087930.489	4.5	6.5	Americium-241	17.340	NA	0.020	76.0	pCi/g
CZ40-003	749520.727	2087930.489	4.5	6.5	Aroclor-1254	36.000	4.500	-	12400.0	ug/kg
CZ40-003	***749520.727***	***2087930.489***	***4.5***	***6.5***	***Plutonium-239/240***	***98.838***	NA	***0.020***	***50.0***	***pCi/g***
CZ40-003	749520.727	2087930.489	4.5	6.5	Uranium-235	0.236	NA	0.120	8.0	pCi/g
CZ40-003	749520.727	2087930.489	6.5	8.5	Uranium-235	0.217	NA	0.120	8.0	pCi/g
CZ40-003	749520.727	2087930.489	8.5	10.5	Americium-241	0.204	NA	0.020	76.0	pCi/g
CZ40-003	*749520.727*	*2087930.489*	*8.5*	*10.5*	*Plutonium-239/240*	*1.160*	NA	*0.020*	*50.0*	*pCi/g*
CZ40-003	749520.727	2087930.489	12.5	13.5	Americium-241	0.252	NA	0.020	76.0	pCi/g
CZ40-003	*749520.727*	*2087930.489*	*12.5*	*13.5*	*Plutonium-239/240*	*1.438*	NA	*0.020*	*50.0*	*pCi/g*
CZ40-003	749520.727	2087930.489	12.5	13.5	Uranium-235	0.398	NA	0.120	8.0	pCi/g
CZ40-004	749508.996	2087864.020	0.0	0.5	Aluminum	18000.000	NA	16902.000	228000.0	mg/kg
CZ40-004	749508.996	2087864.020	0.0	0.5	Lithium	15.000	NA	11.550	20400.0	mg/kg
CZ40-004	749508.996	2087864.020	0.0	0.5	Mercury	0.150	NA	0.134	25200.0	mg/kg
CZ40-004	749508.996	2087864.020	0.0	0.5	Nickel	18.000	NA	14.910	20400.0	mg/kg
CZ40-004	749508.996	2087864.020	0.0	0.5	Strontium	170.000	NA	48.940	613000.0	mg/kg
CZ40-004	*749508.996*	*2087864.020*	*0.0*	*0.5*	*Uranium-234*	*4.049*	NA	*2.253*	*300.0*	*pCi/g*
CZ40-004	749508.996	2087864.020	0.0	0.5	Uranium-235	0.233	NA	0.094	8.0	pCi/g
CZ40-004	749508.996	2087864.020	0.0	0.5	Uranium-238	4.049	NA	2.000	351.0	pCi/g
CZ40-004	*749508.996*	*2087864.020*	*6.5*	*8.5*	*Uranium-234*	*3.489*	NA	*2.640*	*300.0*	*pCi/g*
CZ40-004	749508.996	2087864.020	6.5	8.5	Uranium-235	0.185	NA	0.120	8.0	pCi/g
CZ40-004	749508.996	2087864.020	6.5	8.5	Uranium-238	3.489	NA	1.490	351.0	pCi/g
CZ40-004	*749508.996*	*2087864.020*	*8.5*	*10.5*	*Uranium-234*	*4.189*	NA	*2.640*	*300.0*	*pCi/g*
CZ40-004	749508.996	2087864.020	8.5	10.5	Uranium-235	0.167	NA	0.120	8.0	pCi/g
CZ40-004	749508.996	2087864.020	8.5	10.5	Uranium-238	4.189	NA	1.490	351.0	pCi/g
CZ40-004	749508.996	2087864.020	12.5	14.5	Uranium-235	0.156	NA	0.120	8.0	pCi/g
CZ41-001	749637.875	2087861.490	0.0	0.5	Americium-241	1.250	NA	0.023	76.0	pCi/g
CZ41-001	749637.875	2087861.490	0.0	0.5	Benzo(a)anthracene	41.000	29.000	-	34900.0	ug/kg
CZ41-001	749637.875	2087861.490	0.0	0.5	Benzoic Acid	1100.000	340.000	-	1000000000.0	ug/kg
CZ41-001	749637.875	2087861.490	0.0	0.5	Chromium	18.000	NA	16.990	268.0	mg/kg

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CZ41-001	749637.875	2087861.490	0.0	0.5	Chrysene	49.000	33.000	-	3490000.0	ug/kg
CZ41-001	749637.875	2087861.490	0.0	0.5	Fluoranthene	74.000	27.000	-	27200000.0	ug/kg
CZ41-001	749637.875	2087861.490	0.0	0.5	Plutonium-239/240	6.620	NA	0.066	50.0	pCi/g
CZ41-001	749637.875	2087861.490	0.5	2.5	Acetone	12.000	5.100	-	102000000.0	ug/kg
CZ41-001	749637.875	2087861.490	0.5	2.5	Methylene chloride	3.100	0.890	-	2530000.0	ug/kg
CZ41-001	749637.875	2087861.490	0.5	2.5	Plutonium-239/240	2.270	NA	0.020	50.0	pCi/g
CZ41-001	749637.875	2087861.490	2.5	4.5	Methylene chloride	2.800	0.870	-	2530000.0	ug/kg
CZ41-001	749637.875	2087861.490	4.5	6.5	Acetone	6.100	5.000	-	102000000.0	ug/kg
CZ41-001	749637.875	2087861.490	4.5	6.5	Methylene chloride	2.600	0.870	-	2530000.0	ug/kg
CZ41-001	749637.875	2087861.490	4.5	6.5	Plutonium-239/240	0.089	NA	0.020	50.0	pCi/g
CZ41-001	749637.875	2087861.490	6.5	8.5	Acetone	6.900	4.900	-	102000000.0	ug/kg
CZ41-001	749637.875	2087861.490	6.5	8.5	Methylene chloride	2.900	0.850	-	2530000.0	ug/kg
CZ41-001	749637.875	2087861.490	8.5	10.5	Acetone	6.400	5.200	-	102000000.0	ug/kg
CZ41-001	749637.875	2087861.490	8.5	10.5	Methylene chloride	2.800	0.910	-	2530000.0	ug/kg
CZ41-002	749578.072	2087749.076	0.0	0.5	Americium-241	0.648	NA	0.023	76.0	pCi/g
CZ41-002	*749578.072*	*2087749.076*	*0.0*	*0.5*	*Plutonium-239/240*	*3.694*	NA	*0.066*	*50.0*	*pCi/g*
CZ41-002	749578.072	2087749.076	0.0	0.5	Strontium	73.000	NA	48.940	613000.0	mg/kg
CZ41-002	*749578.072*	*2087749.076*	*0.0*	*0.5*	*Uranium-234*	*4.080*	NA	*2.253*	*300.0*	*pCi/g*
CZ41-002	749578.072	2087749.076	0.0	0.5	Uranium-235	0.261	NA	0.094	8.0	pCi/g
CZ41-002	749578.072	2087749.076	0.0	0.5	Uranium-238	4.080	NA	2.000	351.0	pCi/g
CZ41-002	*749578.072*	*2087749.076*	*0.5*	*2.5*	*Uranium-234*	*3.441*	NA	*2.640*	*300.0*	*pCi/g*
CZ41-002	749578.072	2087749.076	0.5	2.5	Uranium-235	0.207	NA	0.120	8.0	pCi/g
CZ41-002	749578.072	2087749.076	0.5	2.5	Uranium-238	3.441	NA	1.490	351.0	pCi/g
CZ41-008	749687.891	2087876.886	0.0	0.5	Americium-241	1.301	NA	0.023	76.0	pCi/g
CZ41-008	*749687.891*	*2087876.886*	*0.0*	*0.5*	*Plutonium-239/240*	*7.416*	NA	*0.066*	*50.0*	*pCi/g*
CZ41-008	*749687.891*	*2087876.886*	*0.0*	*0.5*	*Uranium-234*	*3.596*	NA	*2.253*	*300.0*	*pCi/g*
CZ41-008	749687.891	2087876.886	0.0	0.5	Uranium-235	0.162	NA	0.094	8.0	pCi/g
CZ41-008	749687.891	2087876.886	0.0	0.5	Uranium-238	3.596	NA	2.000	351.0	pCi/g
CZ41-008	*749687.891*	*2087876.886*	*0.5*	*2.5*	*Uranium-234*	*3.843*	NA	*2.640*	*300.0*	*pCi/g*

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
CZ41-008	749687.891	2087876.886	0.5	2.5	Uranium-235	0.251	NA	0.120	8.0	pCi/g
CZ41-008	749687.891	2087876.886	0.5	2.5	Uranium-238	3.843	NA	1.490	351.0	pCi/g
CZ41-009	749690.549	2087932.689	0.0	0.5	Americium-241	0.972	NA	0.023	76.0	pCi/g
CZ41-009	*749690.549*	*2087932.689*	*0.0*	*0.5*	*Plutonium-239/240*	*5.542*	NA	*0.066*	*50.0*	*pCi/g*
CZ41-009	*749690.549*	*2087932.689*	*0.0*	*0.5*	*Uranium-234*	*3.641*	NA	*2.253*	*300.0*	*pCi/g*
CZ41-009	749690.549	2087932.689	0.0	0.5	Uranium-235	0.216	NA	0.094	8.0	pCi/g
CZ41-009	749690.549	2087932.689	0.0	0.5	Uranium-238	3.641	NA	2.000	351.0	pCi/g
CZ41-009	749690.549	2087932.689	0.5	2.5	Americium-241	0.598	NA	0.020	76.0	pCi/g
CZ41-009	*749690.549*	*2087932.689*	*0.5*	*2.5*	*Plutonium-239/240*	*3.410*	NA	*0.020*	*50.0*	*pCi/g*
CZ41-009	*749690.549*	*2087932.689*	*0.5*	*2.5*	*Uranium-234*	*3.318*	NA	*2.640*	*300.0*	*pCi/g*
CZ41-009	749690.549	2087932.689	0.5	2.5	Uranium-235	0.274	NA	0.120	8.0	pCi/g
CZ41-009	749690.549	2087932.689	0.5	2.5	Uranium-238	3.318	NA	1.490	351.0	pCi/g
DA41-001	749643.128	2087965.619	0.0	0.5	Americium-241	41.720	NA	0.023	76.0	pCi/g
DA41-001	749643.128	2087965.619	0.0	0.5	Aroclor-1254	64.000	5.300	-	12400.0	ug/kg
DA41-001	749643.128	2087965.619	0.0	0.5	Fluoranthene	57.000	27.000	-	27200000.0	ug/kg
DA41-001	749643.128	2087965.619	0.0	0.5	Lithium	15.000	NA	11.550	20400.0	mg/kg
DA41-001	749643.128	2087965.619	0.0	0.5	Mercury	0.210	NA	0.134	25200.0	mg/kg
DA41-001	***749643.128***	***2087965.619***	***0.0***	***0.5***	***Plutonium-239/240***	***237.804***	NA	***0.066***	***50.0***	***pCi/g***
DA41-001	749643.128	2087965.619	0.5	2.5	Americium-241	34.330	NA	0.020	76.0	pCi/g
DA41-001	749643.128	2087965.619	0.5	2.5	Aroclor-1254	150.000	4.900	-	12400.0	ug/kg
DA41-001	749643.128	2087965.619	0.5	2.5	Benzo(a)anthracene	46.000	27.000	-	34900.0	ug/kg
DA41-001	749643.128	2087965.619	0.5	2.5	Benzo(k)fluoranthene	43.000	35.000	-	349000.0	ug/kg
DA41-001	749643.128	2087965.619	0.5	2.5	Chrysene	57.000	31.000	-	3490000.0	ug/kg
DA41-001	749643.128	2087965.619	0.5	2.5	Fluoranthene	110.000	25.000	-	27200000.0	ug/kg
DA41-001	***749643.128***	***2087965.619***	***0.5***	***2.5***	***Plutonium-239/240***	***195.681***	NA	***0.020***	***50.0***	***pCi/g***
DA41-001	*749643.128*	*2087965.619*	*0.5*	*2.5*	*Uranium-234*	*4.328*	NA	*2.640*	*300.0*	*pCi/g*
DA41-001	749643.128	2087965.619	0.5	2.5	Uranium-235	0.291	NA	0.120	8.0	pCi/g
DA41-001	749643.128	2087965.619	0.5	2.5	Uranium-238	4.328	NA	1.490	351.0	pCi/g
DA41-001	749643.128	2087965.619	2.5	4.5	Americium-241	21.610	NA	0.020	76.0	pCi/g

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	RL	Background	WRW AL	Unit
DA41-001	749643.128	2087965.619	2.5	4.5	Aroclor-1254	180.000	4.800	-	12400.0	ug/kg
DA41-001	749643.128	2087965.619	2.5	4.5	Fluoranthene	41.000	25.000	-	27200000.0	ug/kg
DA41-001	***749643.128***	***2087965.619***	***2.5***	***4.5***	***Plutonium-239/240***	***123.177***	NA	***0.020***	***50.0***	***pCi/g***
DA41-001	*749643.128*	*2087965.619*	*2.5*	*4.5*	*Uranium-234*	*5.303*	NA	*2.640*	*300.0*	*pCi/g*
DA41-001	749643.128	2087965.619	2.5	4.5	Uranium-235	0.245	NA	0.120	8.0	pCi/g
DA41-001	749643.128	2087965.619	2.5	4.5	Uranium-238	5.303	NA	1.490	351.0	pCi/g
DA41-001	749643.128	2087965.619	6.5	8.5	Uranium-235	0.441	NA	0.120	8.0	pCi/g
DA41-001	749643.128	2087965.619	6.5	8.5	Uranium-238	1.548	NA	1.490	351.0	pCi/g

Bold denotes AL exceedance.
Italic type denotes values derived from HPGe measurement.
NA – not applicable
SBD – sample begin depth
SED – sample end depth
µg/kg – micrograms per kilogram
mg/kg – milligrams per kilogram
pCi/g – picocuries per gram

Table 4
IHSS Group 900-12 Surface Soil Data Summary Statistics

Analyte	No. of Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Reporting Limit	Background Mean Plus 2 SD	WRW AL	Unit
4,6-Dinitro-2-methylphenol	8	12.50%	390.000	390.000	180.000	NA	1020000	ug/kg
Aluminum	8	37.50%	20333.333	25000.000	NA	16902.000	228000	mg/kg
Americium-241	15	80.00%	6.190	41.720	NA	0.023	76	pCi/g
Aroclor-1254	8	37.50%	1081.333	3000.000	35.133	NA	12400	ug/kg
Barium	8	12.50%	200.000	200.000	NA	141.260	26400	mg/kg
Benzo(a)anthracene	8	25.00%	40.000	41.000	28.000	NA	34900	ug/kg
Benzo(a)pyrene	8	25.00%	70.000	92.000	43.000	NA	3490	ug/kg
Benzo(b)fluoranthene	8	12.50%	40.000	40.000	31.000	NA	34900	ug/kg
Benzoic Acid	8	12.50%	1100.000	1100.000	340.000	NA	1000000000	ug/kg
Chromium	8	50.00%	18.500	20.000	NA	16.990	268	mg/kg
Chrysene	8	37.50%	58.333	87.000	31.000	NA	3490000	ug/kg
Fluoranthene	8	37.50%	66.667	74.000	26.000	NA	27200000	ug/kg
Lithium	8	62.50%	17.200	20.000	NA	11.550	20400	mg/kg
Mercury	8	37.50%	0.203	0.250	NA	0.134	25200	mg/kg
Nickel	8	50.00%	19.250	23.000	NA	14.910	20400	mg/kg
Plutonium-239/240	15	80.00%	35.242	237.804	NA	0.066	50	pCi/g
Strontium	8	62.50%	125.600	170.000	NA	48.940	613000	mg/kg
Uranium-234	15	46.67%	7.184	27.810	NA	2.253	300	pCi/g
Uranium-235	15	73.33%	0.460	3.265	NA	0.094	8	pCi/g
Uranium-238	15	46.67%	7.184	27.810	NA	2.000	351	pCi/g

Table 5
IHSS Group 900-12 Subsurface Soil Data Summary Statistics

Analyte	No. of Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Reporting Limit	Background Mean Plus 2 SD	WRW AL	Unit
2-Methylnaphthalene	45	4.44%	41528.500	83000.000	1816.500	NA	20400000	ug/kg
Acenaphthene	45	2.22%	24000.000	24000.000	3500.000	NA	40800000	ug/kg
Acetone	45	8.89%	7.850	12.000	5.050	NA	102000000	ug/kg
Aluminum	45	2.22%	39000.000	39000.000	NA	35373.170	228000	mg/kg
Americium-241	65	29.23%	19.604	132.700	NA	0.020	76	pCi/g
Anthracene	45	2.22%	8700.000	8700.000	2700.000	NA	204000000	ug/kg
Aroclor-1254	45	17.78%	178.250	730.000	7.325	NA	12400	ug/kg
Arsenic	45	2.22%	14.000	14.000	NA	13.140	22.2	mg/kg
Benzo(a)anthracene	45	6.67%	1901.333	5600.000	951.333	NA	34900	ug/kg
Benzo(a)pyrene	45	13.33%	853.333	4700.000	784.500	NA	3490	ug/kg
Benzo(b)fluoranthene	45	2.22%	45.000	45.000	31.000	NA	34900	ug/kg
Benzo(k)fluoranthene	45	4.44%	50.000	57.000	35.000	NA	349000	ug/kg
Cadmium	45	6.67%	2.300	2.800	NA	1.700	962	mg/kg
Chromium	45	2.22%	82.000	82.000	NA	68.270	268	mg/kg
Chrysene	45	17.78%	1446.000	11000.000	413.375	NA	3490000	ug/kg
Copper	45	2.22%	180.000	180.000	NA	38.210	40900	mg/kg
Dibenzofuran	45	2.22%	7000.000	7000.000	4100.000	NA	2950000	ug/kg
Fluoranthene	45	13.33%	930.333	5200.000	454.167	NA	27200000	ug/kg
Fluorene	45	2.22%	7100.000	7100.000	3800.000	NA	40800000	ug/kg
Indeno(1,2,3-cd)pyrene	45	2.22%	41.000	41.000	23.000	NA	34900	ug/kg
Lead	45	2.22%	350.000	350.000	NA	24.970	1000	mg/kg
Lithium	45	2.22%	44.000	44.000	NA	34.660	20400	mg/kg
Methylene chloride	45	11.11%	2.840	3.100	0.878	NA	2530000	ug/kg
n-Nitrosodiphenylamine	45	2.22%	17000.000	17000.000	3100.000	NA	7810000	ug/kg

Naphthalene	45	2.22%	17000.000	17000.000		NA	3090000	ug/kg
Plutonium-239/240	65	40.00%	85.603	756.390		0.020	50	pCi/g
Pyrene	45	8.89%	9175.000	36000.000		NA	22100000	ug/kg
Silver	45	4.44%	33.500	42.000		24.540	5110	mg/kg
Strontium	45	2.22%	230.000	230.000		211.380	613000	mg/kg
Uranium, Total	45	4.44%	14.100	19.000		3.040	2750	mg/kg
Uranium-234	65	21.54%	4.741	14.620		2.640	300	pCi/g
Uranium-235	65	33.85%	0.278	1.483		0.120	8	pCi/g
Uranium-238	65	26.15%	4.147	14.620		1.490	351	pCi/g
Zinc	45	2.22%	550.000	550.000		139.100	307000	mg/kg

Table 6
RFCA Sums of Ratios Based on Characterization Sampling. Surface Radionuclide Soil Activities

Location Code	Latitude	Longitude	Start Depth (ft)	End Depth (ft)	SOR
CV41-014	749668.825	2087133.202	0.0	0.5	0.046
CV41-014	749668.825	2087133.202	0.5	2.5	0.016
CV41-015	749640.645	2086975.587	0.0	0.5	0.030
CV41-015	749640.645	2086975.587	0.5	2.5	0.006
CV41-016	749653.981	2087055.271	0.0	0.5	0.014
CV41-016	749653.981	2087055.271	0.5	2.5	0.051
CW41-007	749718.660	2087267.567	0.0	0.5	0.138
CW41-007	749718.660	2087267.567	0.5	2.5	0.016
CW41-008	749725.290	2087333.945	0.0	0.5	0.154
CW41-008	749725.290	2087333.945	0.5	2.5	0.020
CX40-003	749538.946	2087498.205	0.0	0.5	0.051
CX40-003	749538.946	2087498.205	0.5	2.5	0.043
CX40-004	749524.709	2087422.668	0.0	0.5	0.437
CY40-002	749559.777	2087619.292	0.0	0.5	0.691
CY40-002	749559.777	2087619.292	0.5	2.5	0.323
CZ40-003	749520.727	2087930.489	0.0	0.5	0.948
CZ40-003	749520.727	2087930.489	0.5	2.5	8.267
CZ40-004	749508.996	2087864.020	0.0	0.5	0.054
CZ41-001	749637.875	2087861.490	0.0	0.5	0.074
CZ41-001	749637.875	2087861.490	0.5	2.5	0.020
CZ41-002	749578.072	2087749.076	0.0	0.5	0.098
CZ41-002	749578.072	2087749.076	0.5	2.5	0.047
CZ41-008	749687.891	2087876.886	0.0	0.5	0.124
CZ41-008	749687.891	2087876.886	0.5	2.5	0.055
CZ41-009	749690.549	2087932.689	0.0	0.5	0.110
CZ41-009	749690.549	2087932.689	0.5	2.5	0.092
DA41-001	749643.128	2087965.619	0.0	0.5	2.599
DA41-001	749643.128	2087965.619	0.5	2.5	2.202

SORs for non-radionuclides were calculated for all surface locations where analyte concentrations were 10 percent or more of a contaminant's WRW AL. SORs for non-radionuclides are presented in Table 7. As shown, SORs for non-radionuclides in surface soil were less than 1.

Table 7
RFCA Sums of Ratios Based on Characterization Sampling, Surface Non-Radionuclide Concentrations

Location Code	Surface Soil SOR
CY40-002	0.242

31

3.0 ACCELERATED ACTION

Remedial action objectives (RAOs) were developed and described in ER RSOP Notification #04-13 (DOE 2004). ER RSOP RAOs include the following:

1. Provide a remedy consistent with the RFETS goal of protection of human health and the environment;

2. Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and

3. Minimize the spread of contaminants during implementation of accelerated actions.

The accelerated action remediation goals for IHSS Group 900-12 are listed below.

- Remove soil with non-radionuclide or uranium contaminant concentrations greater than RFCA WRW ALs to a depth of 6 inches.

- Remove soil with Pu-239/240 or Am-241 activities greater than RFCA WRW ALs to a depth of 3 ft, or to less than the applicable AL, whichever comes first.

- Once contaminated soil is removed, collect confirmation soil samples in accordance with the BZSAP (DOE 2002a).

Accelerated action activities were conducted between January 28, 2004, and September 28, 2004. Start and end dates of significant activities are listed in Table 8. Photographs of site activities are provided in Appendix B.

Table 8
Dates of Accelerated Action Activities

Activity	Start Date	End Date
Characterization Sampling	01/28/04	09/23/04
Removal Activities	07/01/04	09/23/04
Backfill Excavations	07/12/04	09/27/04
Site Reclamation	07/22/04	09/28/04

Soil within the IHSS Group was sampled and, based on the analytical results (Sections 2.1 and 2.2), was removed from IHSSs NE-111.3 (Trench T-6) and NE-111.5 (Trench T-8) in accordance with RFCA and the ER RSOP. The initial excavations at the two trenches were approximately 5 ft by 5 ft by 3 ft deep. Screening samples were collected from the bottoms of the excavations and the side walls, and analyzed using gamma spectroscopy. If screening results indicated Pu-239/240 activities greater than the WRW AL, additional soil was removed, and screening samples were collected from the new excavation boundaries. If screening results indicated Pu-239/240 activities less than the WRW AL, confirmation samples were sent to the off-site laboratory and analyzed using alpha spectroscopy.

Initial results from the bottom of the T-6 and T-8 excavations indicated Pu-239/240 activities were less than the WRW AL; however, screening results from side walls repeatedly exceeded the AL, and additional lateral excavation of the two trenches was

required. After soil excavation and screening were completed, 5 confirmation samples were collected from Trench T-6, and 8 confirmation samples were collected from Trench T-8 (refer to Table 1). Most of the exceedances were in the fill material that overlay the trench contents.

The Trench T-6 excavation was approximately 115 ft by 23 ft by 3 ft, and the Trench T-8 excavation was approximately 122 ft by 20 ft by 3 ft. Excavation boundaries are shown on Figure 4. The removed material was disposed of in intermodal and IP-1 containers as low-level radioactive waste. The T-6 and T-8 excavations were backfilled with clean fill from the Trailer 371 area. The areas were graded, and coconut matting was placed over the excavations. Documentation regarding approval to backfill is provided in Appendix A. All accelerated action objectives were achieved.

4.0 CONFIRMATION SAMPLING

Based on characterization results (Sections 2.1 and 2.2), soil removal and subsequent confirmation sampling were necessary. Soil removal activities are summarized in Section 3.0. Confirmation sampling was required to demonstrate that all residual radioactivity in soil is below WRW ALs or acceptable based on the SSRS. Sampling and analysis was conducted in accordance with the BZSAP (DOE 2002a). Specifications for confirmation sampling are presented in Table 1 and included in the summary of sampling and analysis (Table 2) and the summary statistics (Tables 4 and 5). Results are presented in Table 9 and shown on Figure 4. Only results greater than background means plus two SDs are shown. WRW AL exceedances are shown in Table 9 in bold and in red on Figure 4. All project data, retrieved from SWD on December 13, 2004, are provided on the enclosed CD.

All contaminant concentrations are less than the WRW ALs, with one exception. The Pu-239/240 activity in soil collected from Sampling Location DA41-002 (Trench T-8), at 3.0 – 3.5 ft bgs, is 270 pCi/g, and the WRW AL is 50 pCi/g. However, the activity is less than 1 nCi/g at a depth greater than 3 ft bgs, and based on RFCA and the SSRS (Section 6.0), additional removal is not required (RFCA Attachment 5, DOE et al. 2003).

SORs based on confirmation sampling results for radionuclides are presented in Table 10. SORs for radionuclides were only calculated for soil concentrations within the first 3 ft bgs. SORs for non-radionuclides were not calculated for surface soil concentrations because all non-radionuclide concentrations were less than ten percent of the respective WRW ALs. As shown, SORs for radionuclides are less than 1. The presence of radionuclides below 3 ft and non-radionuclides in subsurface soil are addressed in the SSRS (Section 6.0).

Table 9
IHSS Group 900-12 Confirmation Soil Sampling Data

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	Analyte	Result	Background	WRW AL	Unit
CZ40-010	749520.739	2087916.849	0.5	2.5	Plutonium-239/240	0.265	0.02	50	pCi/g
CZ40-011	749507.926	2087924.453	0.5	2.5	Americium-241	1.320	0.02	76	pCi/g
CZ40-011	749507.926	2087924.453	0.5	2.5	Plutonium-239/240	8.880	0.02	50	pCi/g
DA40-000	749505.126	2087943.713	0.5	2.5	Americium-241	0.340	0.02	76	pCi/g
DA40-000	749505.126	2087943.713	0.5	2.5	Plutonium-239/240	3.740	0.02	50	pCi/g
DA40-002	749525.286	2087945.180	0.5	2.5	Americium-241	0.093	0.02	76	pCi/g
DA40-002	749525.286	2087945.180	0.5	2.5	Plutonium-239/240	0.361	0.02	50	pCi/g
DA41-002	749520.330	2087931.085	3.0	3.5	Americium-241	31.100	0.02	76	pCi/g
DA41-002	**749520.330**	**2087931.085**	**3.0**	**3.5**	**Plutonium-239/240**	**270.000**	**0.02**	**50**	**pCi/g**
DA41-002	749520.330	2087931.085	3.0	3.5	Uranium-234	3.940	2.64	300	pCi/g
DA41-003	749523.545	2087931.170	1.0	1.5	Americium-241	5.850	0.02	76	pCi/g
DA41-003	749523.545	2087931.170	1.0	1.5	Plutonium-239/240	35.500	0.02	50	pCi/g
DA41-004	749519.860	2087991.434	1.0	1.5	Plutonium-239/240	0.134	0.02	50	pCi/g
DA41-006	749507.642	2087873.537	1.0	1.5	Plutonium-239/240	0.287	0.02	50	pCi/g
DA41-007	749643.128	2087965.619	3.8	4.3	Americium-241	0.492	0.02	76	pCi/g
DA41-007	749643.128	2087965.619	3.8	4.3	Plutonium-239/240	2.070	0.02	50	pCi/g
DA41-008	749649.881	2087966.190	1.0	1.5	Americium-241	2.000	0.02	76	pCi/g
DA41-008	749649.881	2087966.190	1.0	1.5	Plutonium-239/240	12.900	0.02	50	pCi/g
DA41-009	749639.230	2087982.670	1.0	1.5	Plutonium-239/240	0.162	0.02	50	pCi/g
DA41-010	749626.278	2087965.228	1.0	1.5	Americium-241	1.000	0.02	76	pCi/g
DA41-010	749626.278	2087965.228	1.0	1.5	Plutonium-239/240	6.260	0.02	50	pCi/g
DA41-011	749632.586	2087871.370	1.0	1.5	Plutonium-239/240	0.172	0.02	50	pCi/g

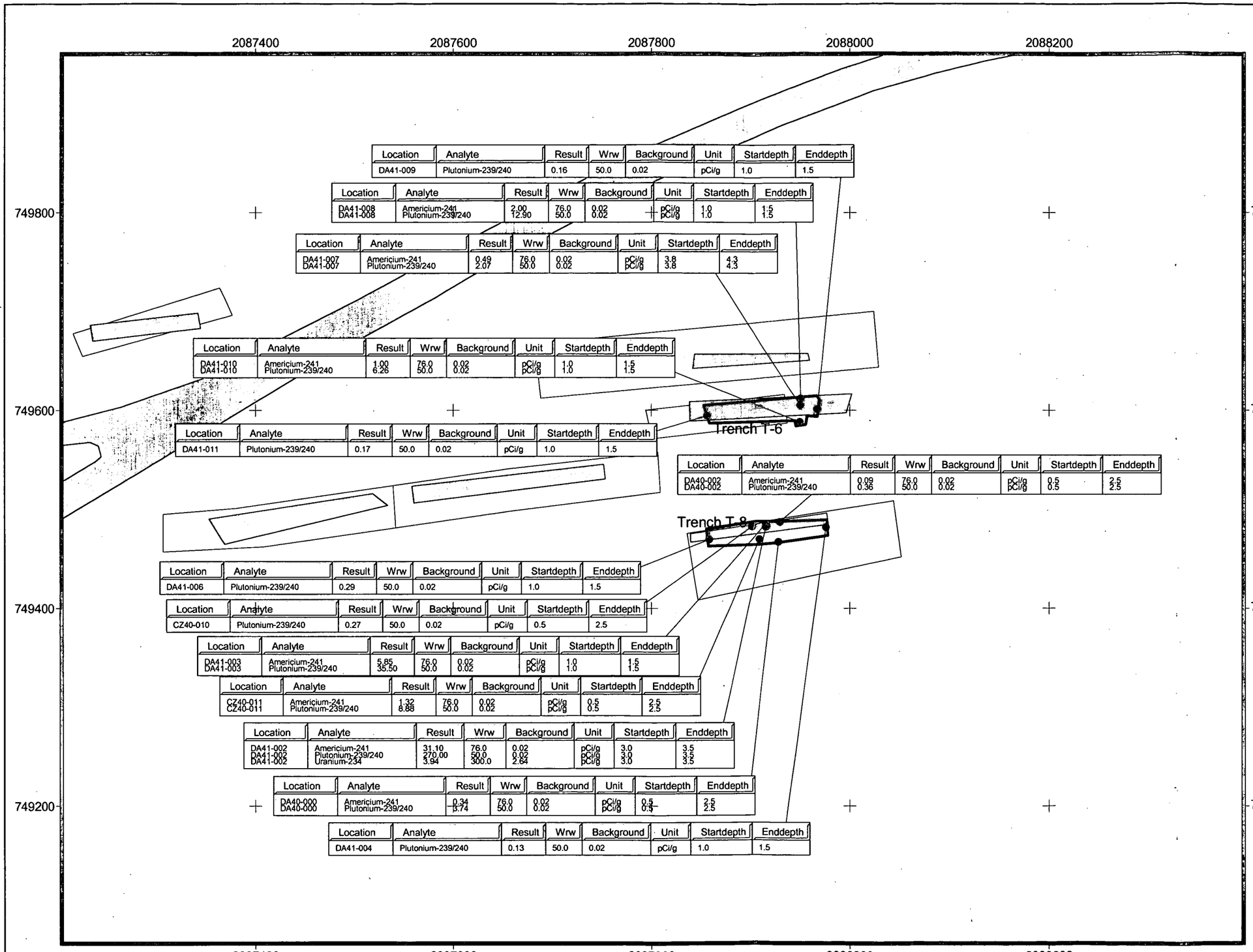

Figure 4
IHSS Group 900-12
Confirmation Sampling
Locations and Results

KEY

- Sampling location with concentration greater than WRW AL
- Sampling location with concentrations less than WRW ALs and greater than background means plus two standard deviations or RLs
- IHSS
- Trench
- Excavation boundary
- Dirt road
- Asphalt

N
W E
S

50 0 50 Feet

Scale = 1:1,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 12.02.2004

Prepared by: RADMS

Prepared for: KAISER•HILL COMPANY

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35

Table 10
RFCA Sums of Ratios Based on Confirmation Sampling, Surface Radionuclide Soil Concentrations

Location Code	Latitude	Longitude	SBD (ft)	SED (ft)	SOR
CZ40-010	749520.739	2087916.849	0.5	2.5	0.002
CZ40-011	749507.926	2087924.453	0.5	2.5	0.094
DA40-000	749505.126	2087943.713	0.5	2.5	0.037
DA40-002	749525.286	2087945.180	0.5	2.5	0.004
DA41-003	749523.545	2087931.170	1	1.5	0.383
DA41-004	749519.860	2087991.434	1	1.5	0.001
DA41-006	749507.642	2087873.537	1	1.5	0.002
DA41-008	749649.881	2087966.190	1	1.5	0.138
DA41-009	749639.230	2087982.670	1	1.5	0.001
DA41-010	749626.278	2087965.228	1	1.5	0.067
DA41-011	749632.586	2087871.370	1	1.5	0.001

5.0 POST-REMEDIATION CONDITIONS

As discussed in Section 3.0, contaminated soil were removed. Clean fill was brought to the project site and used to backfill excavations and contour the surface to prevent ponding of precipitation. Residual surface and subsurface soil concentrations greater than background means plus two SDs or RLs are shown on Figures 5 and 6. The presence of residual contamination was determined based on historical and accelerated action (characterization and confirmation) sampling results. NLR sampling locations (Section 12.0) are not included.

Residual surface and subsurface contaminant concentrations are less than RFCA WRW ALs, except as listed below.

- The Pu-239/240 activity at characterization Sampling Location CZ40-003 (Trench T-8), at 4.5 – 6.5 ft bgs, is 98.84 pCi/g, and the WRW AL is 50 pCi/g.
- The Pu-239/240 activity at confirmation Sampling Location DA41-002 (Trench T-8), at 3.0 – 3.5 ft bgs, is 270 pCi/g, and the WRW AL is 50 pCi/g.
- The Am-241 activity at historical Sampling Location 12795 (Trench T-8), at 3.0 – 8.0 ft bgs, is 104.9 pCi/g, and the WRW AL is 76 pCi/g.
- The chromium concentration at historical Sampling Location 12795 (Trench T-8), at 3.0 – 8.0 ft bgs, is 4,600 mg/kg, and the WRW AL is 268 mg/kg.

36

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 05-RF-00239; KLW-021-05)

Closeout Report IHSS Group 900-12 East Trenches

T-5 (IHSS NE-111.2), T-6 (IHSS NE-111/3, T-8 (IHSS NE-111.5), T9a (IHSS 111.6a), T-9b (IHSS NE-111.6b), T-10 (IHSS NE-111.7), and T-11 (IHSS NE-111.8)

February 2005

Figure 5:

IHSS Group 900-12 Trenches T-5, T-6 and T-8 Residual Soil Concentrations

File: W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr

December 14, 2004

CERCLA Administrative Record Document, BZ-Z-000813

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

37

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 05-RF-00239; KLW-021-05)

Closeout Report IHSS Group 900-12 East Trenches

T-5 (IHSS NE-111.2), T-6 (IHSS NE-111/3, T-8 (IHSS NE-111.5), T9a (IHSS 111.6a), T-9b (IHSS NE-111.6b), T-10 (IHSS NE-111.7), and T-11 (IHSS NE-111.8)

February 2005

Figure 6:

IHSS Group 900-12 Trenches T-9a, T-9b, T-10 and T-11 Residual Soil Concentrations

File: W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr

December 14, 2004

CERCLA Administrative Record Document, BZ-Z-000813

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

- The Pu-239/240 activity at historical Sampling Location 12795 (Trench T-8), at 3.0 – 8.0 ft bgs, is 642 pCi/g, and the WRW AL is 50 pCi/g.
- The Pu-239/240 activity at historical Sampling Location 12795 (Trench T-8), at 8.0 – 10.0 ft bgs, is 131.4 pCi/g, and the WRW AL is 50 pCi/g.
- The benzo(a)pyrene concentration at characterization Sampling Location CY40-002 (Trench T-9a), at 0.5 – 2.5 ft bgs, is 4,700 µg/kg, and the WRW is 3,490 µg/kg.
- The benzo(a)pyrene concentration at historical Sampling Location 10395 (Trench T-10), at 4 – 7 ft bgs, is 11,000 µg/kg, and the WRW is 3,490 µg/kg.
- The benzo(a)pyrene concentration at historical Sampling Location 10395 (Trench T-10), at 7 – 9 ft bgs, is 6,500 µg/kg, and the WRW is 3,490 µg/kg.Figure 5 IHSS Group 900-12 Residual Concentrations, Trenches T-5, T-6 and T-8

Based on RFCA and the SSRS (Section 6.0), these residual activities and concentrations do not require additional soil removal (RFCA Attachment 5, DOE et al. 2003). Pu-239/240 and Am-241 activities are less than 1 nCi/g occurring at a depth greater than 3 ft bgs. With the exception of the benzo(a)pyrene exceedance at 0.5 – 2.5 ft bgs, the other exceedances also occur at a depth greater than 3 ft bgs.

Residual contamination will be further evaluated in the Sitewide CRA and the Accelerated Action Ecological Screening Evaluation (AAESE).

6.0 SUBSURFACE SOIL RISK SCREEN

The SSRS follows the steps identified on Figure 3 in Attachment 5 of the RFCA (DOE et al 2003).

Screen 1 – Are the COC concentrations below RFCA Table 3 WRW soil ALs?

No. Residual COC concentrations in subsurface soil are less than the WRW ALs (RFCA Attachment 5, DOE et al. 2003), with nine exceptions (Section 5.0). Pu-239/240 and Am-241 activities are less than 1 nCi/g at depths greater than 3 ft bgs. With the exception of the benzo(a)pyrene exceedance at 0.5 – 2.5 ft bgs, the other exceedances occur at depths greater than 3 ft bgs.

Screen 2 – Is there a potential for subsurface soil to become surface soil (landslides and erosion areas identified on Figure 1 of RFCA)?

No. IHSS Group 900-12 is not located in an area susceptible to landslides or high erosion (Figure 1 of RFCA) (DOE et al 2003).

Screen 3 – Does subsurface soil radionuclide contamination exceed criteria in RFCA Section 5.3 and Attachment 14?

No. There are five residual radionuclide activities that exceed WRW ALs (Screen 1); however, the activities are less than 1 nCi/g occurring at depths greater than 3 ft bgs.

39

Based on RFCA, additional soil removal is not required (RFCA Attachment 5, DOE et al. 2003).

Screen 4 - Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of surface water standards?

No. Contaminant migration via surface runoff and groundwater are two possible pathways whereby surface water could become contaminated from IHSS Group 900-12 soil. However, erosion is an insignificant pathway because the trenches are in a flat-lying area not prone to erosion. Runoff from the area encompassing Trenches T-5, T-6, T-9a, and T-9b flows into the South Interceptor Ditch (SID) and then into Pond C-2 (DOE 2003c). Water is monitored upstream of Pond C-2 and prior to discharge from Pond C-2. Runoff from the area encompassing Trenches T-10 and T-11 flows to the northeast into South Walnut Creek (below Pond B-4 and above Pond B-5) (DOE 2003c).

The nearest RFCA Point of Evaluation (POE) monitoring station associated with T-5, T-6, T-9a, and T-9b is SW027, located upstream of Pond C-2 (DOE 2003c). Am-241 and Pu-239/240 activities historically have exceeded water quality ALs at this monitoring station. However, most of the annual average Am-241 and Pu-239/240 activities are less than 0.15 picocurie per liter (pCi/L), and neither of the long-term Am-241 and Pu-239/240 averages (Water Year 97 - 01) is greater than 0.15 pCi/L. Also, all of the annual average metal concentrations are less than the ALs, and none of the 30-day averages were reportable. This monitoring station receives water from a large part of the Industrial Area (IA) (IA Areas 400, 600, 800 and 900), and surface water quality at the monitoring station cannot be attributable to any single IHSS Group.

Runoff from T-10 and T-11 flows through RFCA Point of Compliance monitoring station GS08, located downstream of Pond B-5 (DOE 2003c). The runoff does not flow through any upstream POE. Because GSO8 receives flow from a large part of the IA, water quality at this monitoring station can not be used to determine if runoff from Trenches T-10 and T-11 is adversely impacting water quality.

With respect to the groundwater pathway, the trenches are located near a hydraulic divide where water may migrate to the north/northeast or to the south/southeast depending on groundwater levels. Most of the time, groundwater monitoring wells in the vicinity of Trenches T-5, T-6, T-9a, and T-9b are dry. In 1992, there was sufficient groundwater in the area for sampling, and samples were collected from nearby wells 8391 and 8591. The samples at these wells contained VOCs at concentrations greater than RFCA groundwater Tier II ALs, but less than RFCA groundwater Tier I ALs. Pu-239/240, Am-241, benzo(a)pyrene and chromium (contaminants that exceeded soil WRW ALs) were not detected.

During times when local groundwater is present to the northeast side of the area, contamination is captured by the East Trenches Plume Groundwater Collection and Treatment System. Recent groundwater data from two plume extent wells located south and near Trenches T-5, T-6 and T-8 (Wells 04591 and 10194) indicate no VOC contamination (DOE 2002b). The two wells contained U-233/234 and U-238 activities that were greater than RFCA Tier II ALs, but less than background levels. During times when local groundwater is present to the south/southeast, any contaminated groundwater

joins the 903 Pad and Ryan's Pit plume. This plume has migrated toward the SID and Woman Creek drainage; however, discharge to surface water is very limited due to insufficient saturated thickness and dry conditions downgradient (DOE 1999a).

Groundwater in the area of Trenches T-10 and T-11 appears to flow to the north/northeast. This area is included in the pre-existing groundwater plume derived from the 903 Pad area. Four water quality/flow monitoring wells (12191, 12691, 3687, and 11891), associated with the Integrated Monitoring Plan (IMP), are located near these trenches. Concentrations of several VOCs exceeded groundwater Tier II ALs in all four wells since 2000. Results from one well included a Tier II exceedance of Am-241 in 2002. Earlier sampling results from these wells (1987 – 2000) indicated Tier II exceedances of total metals, including aluminum, antimony, barium, beryllium, cadmium, lead, manganese, mercury, nickel, and vanadium. Groundwater wells 3687, 11891 and 12691 had Tier I exceedances of VOCs (carbon tetrachloride, chloroform, dibromochloromethane, methylene chloride, tetrachloroethene, and trichloroethene) prior to 2000. Groundwater quality in the area is addressed in the Site Groundwater Interim Measure/Interim Remedial Action decision document.

7.0 STEWARDSHIP ANALYSIS

This stewardship evaluation, applicable to IHSS Group 900-12, is documented in the following sections. The regulatory agencies were informed of project activities and characterization results through frequent project updates, e-mails, telephone contacts, and personal contact throughout the project duration. The stewardship evaluation was conducted through ongoing consultation with the regulatory agencies. Copies of these documents are provided in Appendix A.

7.1 Current Site Conditions

As discussed in Section 3.0, accelerated actions at IHSS Group 900-12 consisted of removing contaminated soil and debris in Trenches T-6 and T-8. The excavations are shown on Figure 4. Based on the accelerated action, current conditions at IHSS Group 900-12 are listed below.

- Potential sources of contamination that existed in IHSS Group 900-12 were removed, including contaminated soil and debris.
- Residual surface and subsurface contaminant concentrations in soil are greater than background means plus two SDs or RLs throughout the IHSS Group.
- Residual surface and subsurface contaminant activities and concentrations are less than RFCA WRW ALs, with nine exceptions (Section 5.0). Based on RFCA and the SSRS (Section 6.0), the WRW exceedances do not require additional soil removal (RFCA Attachment 5, DOE et al. 2003). Pu-239/240 and Am-241 activities are less than 1 nCi/g occurring at a depth greater than 3 ft bgs. With the exception of the benzo(a)pyrene exceedance at 0.5 – 2.5 ft bgs, the other exceedances also occur at a depth greater than 3 ft bgs.

41

7.2 Near-Term Management Recommendations

No specific near-term management techniques are required. Contaminant concentrations in soil remaining at IHSS Group 900-12 do not trigger any further accelerated action. Near-term recommendations include the following:

- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process; and
- Site access and security controls and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

7.3 Long-Term Stewardship Recommendations

Based on remaining environmental conditions at IHSS Group 900-12, no IHSS Group-specific long-term stewardship activities are recommended beyond the generally applicable Site requirements. These requirements may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include the following:

- Prohibitions on construction of buildings;
- Restrictions on excavation or other soil disturbance; and
- Prohibitions on groundwater pumping in the area of IHSS Group 900-12.

No specific engineered controls or environmental monitoring are recommended as a result of the conditions remaining at IHSS Group 900-12. Likewise, no specific institutional or physical controls, such as fences, are recommended as a result of the conditions remaining at IHSS Group 900-12.

This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file. The specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy.

IHSS Group 900-12 will be evaluated as part of the Sitewide CRA, which is part of the RCRA Remedial Investigation/Feasibility Study (RI/FS) that will be conducted for the Site. The need for and extent of any more general, long-term stewardship activities will also be evaluated in the RI/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will be contained in the Corrective Action Decision/Record of Decision and any post-RFCA agreement.

8.0 DEVIATIONS FROM THE ER RSOP

Removal methods and objectives did not deviate from the ER RSOP.

9.0 RCRA UNIT CLOSURE

IHSS Group 900-12 did not have any Resource Conservation and Recovery Act (RCRA) permitted waste management units, and therefore, RCRA closure was not required as part of this accelerated action.

10.0 WASTE MANAGEMENT

Approximately 420 cy of material were removed from Trenches T-6 and T-8. The removed material was disposed of in intermodal and IP-1 containers as low-level radioactive waste

11.0 SITE RECLAMATION

The T-6 and T-8 excavations were backfilled with approximately 420 cy of clean fill obtained from the Trailer 371 area. The areas were then graded, and coconut matting was placed over the excavations.

12.0 NO LONGER REPRESENTATIVE SAMPLING LOCATIONS

The historical sampling locations that were impacted by soil removal include one in Trench T-6 (11695) and two in Trench T-8 (12795 and 12895) (Figure 2). The characterization sampling locations that were impacted by soil removal include one in Trench T-6 (DA41-001) and one in Trench T-8 (CZ40-003) (Figure 3). These NLR locations are listed in Table 11. Related data have been marked in SWD and will not be used in the CRA or other site analyses.

Table 11
No Longer Representative Sampling Locations and Intervals

Sampling Location / Interval	Trench	Easting	Northing
11695 / A-C	6	2087914.130	749638.000
DA41-001 / A-C	6	2087965.619	749643.128
12795 / A-C	8	2087948.250	749515.375
12895 / A-C	8	2087981.500	749527.188
CZ40-003 / A-C	8	2087930.489	749520.727

13.0 DATA QUALITY ASSESSMENT

The DQOs for this project are described in the IASAP (DOE 2001). All DQOs for this project were achieved based on the following:

- Regulatory agency-approved sampling program design (BZSAP Addendum #BZ-04-02 [DOE 2003a] and FY04 Notification #04-13), modified due to field conditions, in accordance with the IASAP (DOE 2001);
- Collection of samples in accordance with the sampling design; and

- Results of the DQA, as described in the following sections.

13.1 Data Quality Assessment Process

The DQA process ensures that the type, quantity, and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements:

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process;
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis; and
- U.S. Department of Energy (DOE) Order 414.1A, 1999b, Quality Assurance.

Verification and validation (V&V) of data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review;
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review;
- Kaiser-Hill Company, L.L.C. (K-H), 2002, General Guidelines for Data Verification and Validation, DA-GR01-v2, October;
    - K-H, 2002, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, October;
    - K-H, 2002, V&V Guidelines for Volatile Organics, DA-SS01-v3, October;
    - K-H, 2002, V&V Guidelines for Semivolatile Organics, DA-SS02-v3, October;
    - K-H, 2002, V&V Guidelines for Metals, DA-SS05-v3, October; and
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This report will be submitted to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) AR for permanent storage 30 days after being provided to the Colorado Department of Public Health and Environment (CDPHE) and/or EPA.

13.2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSDs);
- Laboratory control samples (LCSs);
- Field duplicate measurements;
- Chemical yield (radiochemistry);
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (i.e., within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records.

Raw hard-copy data (for example, individual analytical data packages) are currently filed by report identification number and maintained by K-H Analytical Services Division; older hard copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in SWD.

Both real and QC data are included on the enclosed CD.

13.2.1 Accuracy

The following measures of accuracy were considered:

- LCS evaluation;

- Surrogate evaluation;
- Field blank evaluation; and
- Sample MS evaluation.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the result could impact project decisions. Particular attention is paid to those values near ALs when QC results could indicate unacceptable levels of uncertainty for decision-making purposes.

Laboratory Control Sample Evaluation

As indicated in Table 12, LCS analyses were run for all methods except for gamma spectroscopy. When the In-Situ Counting System technique is used for gamma spectroscopy, an internal standard approach is used instead of LCSs. The onsite laboratory that performs gamma spectroscopy is therefore not required to provide LCS data.

Table 12
LCS Summary

Test Method	Lab Batch	Laboratory Control Sample
Alpha Spec	4050209	Yes
Alpha Spec	4050210	Yes
Alpha Spec	4050213	Yes
Alpha Spec	4194609	Yes
Alpha Spec	4194613	Yes
Alpha Spec	4194615	Yes
Alpha Spec	4196502	Yes
Alpha Spec	4196503	Yes
Alpha Spec	4196508	Yes
Alpha Spec	4198424	Yes
Alpha Spec	4198431	Yes
Alpha Spec	4198454	Yes
Alpha Spec	4205498	Yes
Alpha Spec	4205499	Yes
Alpha Spec	4205501	Yes
Alpha Spec	4210283	Yes
Alpha Spec	4210284	Yes
Alpha Spec	4210288	Yes
SW-846 6010	4034481	Yes
SW-846 6010	4035187	Yes
SW-846 6010	4036538	Yes
SW-846 6010	4037184	Yes
SW-846 6010	4040525	Yes
SW-846 6010	4041171	Yes

Test Method	Lab Batch	Laboratory Control Sample
SW-846 6010	4042543	Yes
SW-846 6010	4043323	Yes
SW-846 6010	4043529	Yes
SW-846 6010	4044174	Yes
SW-846 6010	4049580	Yes
SW-846 6010	4050156	Yes
SW-846 6010	4189133	Yes
SW-846 6010	4189536	Yes
SW-846 8082	4034465	Yes
SW-846 8082	4036514	Yes
SW-846 8082	4040522	Yes
SW-846 8082	4042540	Yes
SW-846 8082	4043522	Yes
SW-846 8082	4049578	Yes
SW-846 8082	4188569	Yes
SW-846 8260	4050366	Yes
SW-846 8260	MS1 VOA_040630A	Yes
SW-846 8260	MS2 VOA_040128A	Yes
SW-846 8260	MS2 VOA_040205A	Yes
SW-846 8260	MS2 VOA_040209A	Yes
SW-846 8260	MS2 VOA_040211A	Yes
SW-846 8260	MS3 VOA_040203B	Yes
SW-846 8260	MS3 VOA_040204A	Yes
SW-846 8270	4034468	Yes
SW-846 8270	4036520	Yes
SW-846 8270	4040523	Yes
SW-846 8270	4042541	Yes
SW-846 8270	4043521	Yes
SW-846 8270	4049579	Yes
SW-846 8270	4188570	Yes

The minimum and maximum LCS results are tabulated, by chemical, for the entire project in Table 13. LCS results that were outside of tolerances were reviewed to determine whether a potential bias might be indicated. LCS recoveries are not indicative of matrix effects because they are not prepared using site samples. LCS results do indicate whether the laboratory may be introducing a bias in the results. Recoveries reported above the upper limit may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed. The analytes with unacceptable low recoveries were evaluated. If the highest sample result less than the AL, divided by the lowest LCS recovery for that analyte, is less than the AL, no further action is taken because any indicated bias is not great enough to affect project

decisions. As a result of this analysis, the LCS recoveries for this project did not impact project decisions.

Table 13
LCS Evaluation Summary

Test Method	CAS No.	Analyte	Min. of Result	Max. of Result	Result Unit
SW-846 8260	71-55-6	1,1,1-Trichloroethane	95.86	123.8	%REC
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	88.17	107	%REC
SW-846 8260	79-00-5	1,1,2-Trichloroethane	87	105.4	%REC
SW-846 8260	75-34-3	1,1-Dichloroethane	97.58	127.9	%REC
SW-846 8260	75-35-4	1,1-Dichloroethene	98.72	143.8	%REC
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	62	67	%REC
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	78	121.5	%REC
SW-846 8260	95-50-1	1,2-Dichlorobenzene	81	115.5	%REC
SW-846 8260	107-06-2	1,2-Dichloroethane	95.24	120.9	%REC
SW-846 8260	78-87-5	1,2-Dichloropropane	99.25	114.1	%REC
SW-846 8260	106-46-7	1,4-Dichlorobenzene	83	116.1	%REC
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	62	73	%REC
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	62	72	%REC
SW-846 8270	120-83-2	2,4-Dichlorophenol	64	68	%REC
SW-846 8270	105-67-9	2,4-Dimethylphenol	63	71	%REC
SW-846 8270	51-28-5	2,4-Dinitrophenol	47	70	%REC
SW-846 8270	121-14-2	2,4-Dinitrotoluene	64	72	%REC
SW-846 8270	606-20-2	2,6-Dinitrotoluene	63	70	%REC
SW-846 8260	78-93-3	2-Butanone	46.13	122	%REC
SW-846 8270	91-58-7	2-Chloronaphthalene	61	66	%REC
SW-846 8270	95-57-8	2-Chlorophenol	65	70	%REC
SW-846 8270	91-57-6	2-Methylnaphthalene	65	70	%REC
SW-846 8270	95-48-7	2-Methylphenol	63	72	%REC
SW-846 8270	88-74-4	2-Nitroaniline	63	67	%REC
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	42	58	%REC
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	55	67	%REC
SW-846 8270	106-47-8	4-Chloroaniline	39	58	%REC
SW-846 8260	108-10-1	4-Methyl-2-pentanone	74.33	109	%REC
SW-846 8270	106-44-5	4-Methylphenol	64	71	%REC
SW-846 8270	100-02-7	4-Nitrophenol	64	77	%REC
SW-846 8270	83-32-9	Acenaphthene	59	66	%REC
SW-846 8260	67-64-1	Acetone	36.85	100	%REC
SW-846 6010	7429-90-5	Aluminum	97	109	%REC
SW-846 8270	120-12-7	Anthracene	61	68	%REC
SW-846 6010	7440-36-0	Antimony	91	98	%REC
SW-846 8082	12674-11-2	Aroclor-1016	90	119	%REC
SW-846 8082	11096-82-5	Aroclor-1260	84	119	%REC
SW-846 6010	7440-38-2	Arsenic	91	100	%REC

48

Test Method	CAS No.	Analyte	Min. of Result	Max. of Result	Result Unit
SW-846 6010	7440-39-3	Barium	97	106	%REC
SW-846 8260	71-43-2	Benzene	100.2	116.2	%REC
SW-846 8270	56-55-3	Benzo(a)anthracene	59	66	%REC
SW-846 8270	50-32-8	Benzo(a)pyrene	60	66	%REC
SW-846 8270	205-99-2	Benzo(b)fluoranthene	59	68	%REC
SW-846 8270	207-08-9	Benzo(k)fluoranthene	58	67	%REC
SW-846 8270	65-85-0	Benzoic acid	43	66	%REC
SW-846 8270	100-51-6	Benzyl alcohol	67	73	%REC
SW-846 6010	7440-41-7	Beryllium	95	106	%REC
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	57	75	%REC
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	59	70	%REC
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	55	73	%REC
SW-846 8260	75-27-4	Bromodichloromethane	94.75	118.3	%REC
SW-846 8260	75-25-2	Bromoform	84	104	%REC
SW-846 8260	74-83-9	Bromomethane	76.97	137.4	%REC
SW-846 8270	85-68-7	Butylbenzylphthalate	58	68	%REC
SW-846 6010	7440-43-9	Cadmium	91	99	%REC
SW-846 8260	75-15-0	Carbon disulfide	76	137.8	%REC
SW-846 8260	56-23-5	Carbon tetrachloride	95.04	124	%REC
SW-846 8260	108-90-7	Chlorobenzene	87	113.4	%REC
SW-846 8260	75-00-3	Chloroethane	78.03	144	%REC
SW-846 8260	67-66-3	Chloroform	95.37	125.1	%REC
SW-846 8260	74-87-3	Chloromethane	67.26	197.3	%REC
SW-846 6010	7440-47-3	Chromium	94	103	%REC
SW-846 8270	218-01-9	Chrysene	59	65	%REC
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	98	117	%REC
SW-846 6010	7440-48-4	Cobalt	93	100	%REC
SW-846 6010	7440-50-8	Copper	92	103	%REC
SW-846 8270	84-74-2	Di-n-butylphthalate	60	71	%REC
SW-846 8270	117-84-0	Di-n-octylphthalate	49	68	%REC
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	56	65	%REC
SW-846 8270	132-64-9	Dibenzofuran	64	71	%REC
SW-846 8260	124-48-1	Dibromochloromethane	87	110.2	%REC
SW-846 8270	84-66-2	Diethylphthalate	62	71	%REC
SW-846 8270	131-11-3	Dimethylphthalate	63	68	%REC
SW-846 8260	100-41-4	Ethylbenzene	87	118.3	%REC
SW-846 8270	206-44-0	Fluoranthene	59	77	%REC
SW-846 8270	86-73-7	Fluorene	61	68	%REC
SW-846 8270	118-74-1	Hexachlorobenzene	61	66	%REC
SW-846 8260	87-68-3	Hexachlorobutadiene	74	125.3	%REC
SW-846 8270	87-68-3	Hexachlorobutadiene	62	66	%REC
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	24	59	%REC

49

Test Method	CAS No.	Analyte	Min. of Result	Max. of Result	Result Unit
SW-846 8270	67-72-1	Hexachloroethane	65	69	%REC
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	57	66	%REC
SW-846 6010	7439-89-6	Iron	97	110	%REC
SW-846 8270	78-59-1	Isophorone	61	68	%REC
SW-846 6010	7439-92-1	Lead	94	101	%REC
SW-846 6010	7439-93-2	Lithium	91	105	%REC
SW-846 6010	7439-96-5	Manganese	95	103	%REC
SW-846 6010	7439-97-6	Mercury	89	100	%REC
SW-846 8260	75-09-2	Methylene chloride	93.21	129.1	%REC
SW-846 6010	7439-98-7	Molybdenum	90	99	%REC
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	66	84	%REC
SW-846 8270	621-64-7	n-Nitrosodipropylamine	63	71	%REC
SW-846 8270	91-20-3	Naphthalene	61	67	%REC
SW-846 8260	91-20-3	Naphthalene	80	110.7	%REC
SW-846 6010	7440-02-0	Nickel	94	100	%REC
SW-846 8270	98-95-3	Nitrobenzene	64	70	%REC
SW-846 8270	87-86-5	Pentachlorophenol	55	72	%REC
SW-846 8270	108-95-2	Phenol	63	70	%REC
SW-846 8270	129-00-0	Pyrene	57	65	%REC
SW-846 6010	7782-49-2	Selenium	88	99	%REC
SW-846 6010	7440-22-4	Silver	91	98	%REC
SW-846 6010	7440-24-6	Strontium	96	104	%REC
SW-846 8260	100-42-5	Styrene	90	115	%REC
SW-846 8260	127-18-4	Tetrachloroethene	83	117.7	%REC
SW-846 6010	7440-31-5	Tin	86	95	%REC
SW-846 8260	108-88-3	Toluene	90	118.5	%REC
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	95	117	%REC
SW-846 8260	79-01-6	Trichloroethene	99.72	120.7	%REC
SW-846 6010	11-09-6	Uranium, Total	97	105	%REC
SW-846 6010	7440-62-2	Vanadium	94	103	%REC
SW-846 8260	75-01-4	Vinyl chloride	72.76	170.3	%REC
SW-846 8260	1330-20-7	Xylene	89	115	%REC
SW-846 6010	7440-66-6	Zinc	93	104	%REC

% REC – percent recovery

Surrogate Evaluation

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 14. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Surrogates are added to every sample, and therefore, surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix effects. The highest and lowest surrogate recoveries for this project were

50

reviewed, and no results affect project decisions. All organic compounds with surrogate recoveries had concentrations less than RLs.

Table 14
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum Concentration**	**Maximum Concentration**	**Result Unit**
45	4-Bromofluorobenzene	89.45	123.3	%REC
45	Deuterated 1,2-dichloroethane	89.23	112	%REC
45	Deuterated toluene	83.16	104.2	%REC
SVOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum Concentration**	**Maximum Concentration**	**Result Unit**
52	2-Fluorobiphenyl	52	74	%REC
52	2-Fluorophenol	53	83	%REC
52	Deuterated nitrobenzene	54	79	%REC
52	p-Terphenyl-d14	48	77	%REC

Field Blank Evaluation

Results of the field blank analyses are given in Table 15. Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples. When the real result is less than 10 times the blank result for laboratory contaminants and 5 times the result for non-laboratory contaminants, the real result is eliminated. None of the chemicals were detected in the blanks at concentrations greater than one-tenth the AL. Therefore, blank contamination did not adversely impact project decisions.

Sample Matrix Spike Evaluation

The minimum and maximum MS results are summarized by chemical for the entire project in Table 16. Organic analytes with unacceptable low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines, if organic MS recoveries are low, the data reviewer may use the MS and MSD results in conjunction with other QC criteria. In this case, the LCS recoveries were checked. For this project, these checks indicate no decisions were impacted for organic analytes. For inorganics, the associated maximum sample results were divided by the lowest percent recovery for each analyte. If the resulting number was less than the AL, decisions were not impacted, and no action was taken. For this project, all results were acceptable. Aluminum and iron had low recoveries of 0 percent; however, project decisions were not impacted. The WRW ALs for these two metals are at least three times greater than the highest sample result.

51

Table 15
Field Blank Summary

Laboratory	CAS	Analyte	Sample QC Code	Detected Result	Result Unit
URS	78-93-3	2-Butanone	FB	13	ug/L
URS	91-20-3	Naphthalene	FB	1.4	ug/L
URS	91-20-3	Naphthalene	TB	2.1	ug/L
URS	15117-96-1	Uranium-235	FB	0.18	pCi/g
URS	15117-96-1	Uranium-235	RNS	0.112	pCi/g
URS	7440-61-1	Uranium-238	FB	3.19	pCi/g
URS	7440-61-1	Uranium-238	RNS	3.08	pCi/g
Field blank (EB = equipment, field = FB, rinse = RNS, trip = TB) results greater than detection limits (not "U" qualified).					

Table 16
Sample MS Evaluation Summary

Test Method	CAS No.	Analyte	Min. of Result	Max. of Result	Unit	No. of Samples	No. of Lab Batches
SW-846 8260	71-55-6	1,1,1-Trichloroethane	61.46	103	%REC	5	5
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	51.87	103	%REC	5	5
SW-846 8260	79-00-5	1,1,2-Trichloroethane	57.71	104.6	%REC	5	5
SW-846 8260	75-34-3	1,1-Dichloroethane	64.34	105	%REC	5	5
SW-846 8260	75-35-4	1,1-Dichloroethene	61.23	106	%REC	5	5
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	23.63	105	%REC	5	5
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	57	66	%REC	3	3
SW-846 8260	95-50-1	1,2-Dichlorobenzene	38.23	100	%REC	5	5
SW-846 8260	107-06-2	1,2-Dichloroethane	63.08	105	%REC	5	5
SW-846 8260	78-87-5	1,2-Dichloropropane	59.16	99	%REC	5	5
SW-846 8260	106-46-7	1,4-Dichlorobenzene	39.15	101	%REC	5	5
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	61	68	%REC	3	3
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	58	63	%REC	3	3
SW-846 8270	120-83-2	2,4-Dichlorophenol	58	65	%REC	3	3
SW-846 8270	105-67-9	2,4-Dimethylphenol	60	69	%REC	3	3
SW-846 8270	51-28-5	2,4-Dinitrophenol	27	43	%REC	3	3
SW-846 8270	121-14-2	2,4-Dinitrotoluene	59	68	%REC	3	3
SW-846 8270	606-20-2	2,6-Dinitrotoluene	60	69	%REC	3	3
SW-846 8260	78-93-3	2-Butanone	62.36	174.6	%REC	5	5
SW-846 8270	91-58-7	2-Chloronaphthalene	58	62	%REC	3	3
SW-846 8270	95-57-8	2-Chlorophenol	58	70	%REC	3	3
SW-846 8270	91-57-6	2-Methylnaphthalene	59	68	%REC	3	3
SW-846 8270	95-48-7	2-Methylphenol	59	70	%REC	3	3
SW-846 8270	88-74-4	2-Nitroaniline	60	66	%REC	3	3
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	45	57	%REC	3	3
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	44	53	%REC	3	3

52

Test Method	CAS No.	Analyte	Min. of Result	Max. of Result	Unit	No. of Samples	No. of Lab Batches
SW-846 8270	106-47-8	4-Chloroaniline	44	56	%REC	3	3
SW-846 8260	108-10-1	4-Methyl-2-pentanone	57.88	109.3	%REC	5	5
SW-846 8270	106-44-5	4-Methylphenol	62	69	%REC	3	3
SW-846 8270	100-02-7	4-Nitrophenol	60	69	%REC	3	3
SW-846 8270	83-32-9	Acenaphthene	57	63	%REC	3	3
SW-846 8260	67-64-1	Acetone	66.65	222.5	%REC	5	5
SW-846 6010	7429-90-5	Aluminum	0	3900	%REC	4	4
SW-846 8270	120-12-7	Anthracene	59	66	%REC	3	3
SW-846 6010	7440-36-0	Antimony	49	70	%REC	4	4
SW-846 8082	12674-11-2	Aroclor-1016	84	122	%REC	5	5
SW-846 8082	11096-82-5	Aroclor-1260	93	172	%REC	5	5
SW-846 6010	7440-38-2	Arsenic	90	98	%REC	4	4
SW-846 6010	7440-39-3	Barium	102	124	%REC	4	4
SW-846 8260	71-43-2	Benzene	60.33	100	%REC	5	5
SW-846 8270	56-55-3	Benzo(a)anthracene	56	64	%REC	3	3
SW-846 8270	50-32-8	Benzo(a)pyrene	57	63	%REC	3	3
SW-846 8270	205-99-2	Benzo(b)fluoranthene	60	62	%REC	3	3
SW-846 8270	207-08-9	Benzo(k)fluoranthene	54	63	%REC	3	3
SW-846 8270	65-85-0	Benzoic acid	18	33	%REC	3	3
SW-846 8270	100-51-6	Benzyl alcohol	61	69	%REC	3	3
SW-846 6010	7440-41-7	Beryllium	81	96	%REC	4	4
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	54	66	%REC	3	3
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	57	66	%REC	3	3
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	61	65	%REC	3	3
SW-846 8260	75-27-4	Bromodichloromethane	60.59	102	%REC	5	5
SW-846 8260	75-25-2	Bromoform	56.5	100.5	%REC	5	5
SW-846 8260	74-83-9	Bromomethane	71.12	116	%REC	5	5
SW-846 8270	85-68-7	Butylbenzylphthalate	60	67	%REC	3	3
SW-846 6010	7440-43-9	Cadmium	85	89	%REC	4	4
SW-846 8260	75-15-0	Carbon disulfide	45.76	108.9	%REC	5	5
SW-846 8260	56-23-5	Carbon tetrachloride	57.35	105	%REC	5	5
SW-846 8260	108-90-7	Chlorobenzene	50.3	99	%REC	5	5
SW-846 8260	75-00-3	Chloroethane	64.08	114.4	%REC	5	5
SW-846 8260	67-66-3	Chloroform	62.88	102	%REC	5	5
SW-846 8260	74-87-3	Chloromethane	63.56	114.6	%REC	5	5
SW-846 6010	7440-47-3	Chromium	50	955	%REC	4	4
SW-846 8270	218-01-9	Chrysene	54	62	%REC	3	3
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	53.44	105	%REC	5	5
SW-846 6010	7440-48-4	Cobalt	86	96	%REC	4	4
SW-846 6010	7440-50-8	Copper	97	112	%REC	4	4
SW-846 8270	84-74-2	Di-n-butylphthalate	59	68	%REC	3	3

53

Test Method	CAS No.	Analyte	Min. of Result	Max. of Result	Unit	No. of Samples	No. of Lab Batches
SW-846 8270	117-84-0	Di-n-octylphthalate	56	65	%REC	3	3
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	55	62	%REC	3	3
SW-846 8270	132-64-9	Dibenzofuran	60	68	%REC	3	3
SW-846 8260	124-48-1	Dibromochloromethane	56.45	99	%REC	5	5
SW-846 8270	84-66-2	Diethylphthalate	63	67	%REC	3	3
SW-846 8270	131-11-3	Dimethylphthalate	60	66	%REC	3	3
SW-846 8260	100-41-4	Ethylbenzene	48.1	101	%REC	5	5
SW-846 8270	206-44-0	Fluoranthene	52	69	%REC	3	3
SW-846 8270	86-73-7	Fluorene	58	66	%REC	3	3
SW-846 8270	118-74-1	Hexachlorobenzene	59	62	%REC	3	3
SW-846 8260	87-68-3	Hexachlorobutadiene	15.26	103	%REC	5	5
SW-846 8270	87-68-3	Hexachlorobutadiene	58	67	%REC	3	3
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	17	51	%REC	3	3
SW-846 8270	67-72-1	Hexachloroethane	58	70	%REC	3	3
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	55	62	%REC	3	3
SW-846 6010	7439-89-6	Iron	0	2760	%REC	4	4
SW-846 8270	78-59-1	Isophorone	53	66	%REC	3	3
SW-846 6010	7439-92-1	Lead	92	99	%REC	4	4
SW-846 6010	7439-93-2	Lithium	94	102	%REC	4	4
SW-846 6010	7439-96-5	Manganese	56	157	%REC	4	4
SW-846 6010	7439-97-6	Mercury	75	100	%REC	5	5
SW-846 8260	75-09-2	Methylene chloride	64.56	104.9	%REC	5	5
SW-846 6010	7439-98-7	Molybdenum	89	92	%REC	4	4
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	67	76	%REC	3	3
SW-846 8270	621-64-7	n-Nitrosodipropylamine	60	69	%REC	3	3
SW-846 8260	91-20-3	Naphthalene	29.8	92	%REC	5	5
SW-846 8270	91-20-3	Naphthalene	57	65	%REC	3	3
SW-846 6010	7440-02-0	Nickel	79	251	%REC	4	4
SW-846 8270	98-95-3	Nitrobenzene	59	72	%REC	3	3
SW-846 8270	87-86-5	Pentachlorophenol	44	50	%REC	3	3
SW-846 8270	108-95-2	Phenol	59	69	%REC	3	3
SW-846 8270	129-00-0	Pyrene	57	61	%REC	3	3
SW-846 6010	7782-49-2	Selenium	87	97	%REC	4	4
SW-846 6010	7440-22-4	Silver	92	107	%REC	4	4
SW-846 6010	7440-24-6	Strontium	83	198	%REC	4	4
SW-846 8260	100-42-5	Styrene	46.4	101	%REC	5	5
SW-846 8260	127-18-4	Tetrachloroethene	47.88	100	%REC	5	5
SW-846 6010	7440-31-5	Tin	84	93	%REC	4	4
SW-846 8260	108-88-3	Toluene	54.8	99	%REC	5	5
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	48.84	104	%REC	5	5
SW-846 8260	79-01-6	Trichloroethene	58.56	102	%REC	5	5

54

Test Method	CAS No.	Analyte	Min. of Result	Max. of Result	Unit	No. of Samples	No. of Lab Batches
SW-846 6010	11-09-6	Uranium, Total	86	99	%REC	4	4
SW-846 6010	7440-62-2	Vanadium	55	110	%REC	4	4
SW-846 8260	75-01-4	Vinyl chloride	61.62	109.3	%REC	5	5
SW-846 8260	1330-20-7	Xylene	47.81	99	%REC	5	5
SW-846 6010	7440-66-6	Zinc	66	104	%REC	4	4

13.2.2 Precision

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSDs, which is summarized in Table 17. Analytes with the highest relative percent differences (RPDs) were reviewed by comparing the highest sample result to the WRW AL. For analytes with RPDs greater than 35 percent, if the highest sample concentrations were sufficiently below the AL, no further action is needed. For this project, the review indicated decisions were not impacted. However, the decision on whether to remediate the chromium concentration is based on not only an AL comparison but also the results of the SSRS.

Table 17
Sample MSD Evaluation Summary

Test Method	CAS No.	Analyte	Max of RPD
SW-846 8260	71-55-6	1,1,1-Trichloroethane	51.150
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	57.039
SW-846 8260	79-00-5	1,1,2-Trichloroethane	52.846
SW-846 8260	75-34-3	1,1-Dichloroethane	43.778
SW-846 8260	75-35-4	1,1-Dichloroethene	43.552
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	98.725
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	11.570
SW-846 8260	95-50-1	1,2-Dichlorobenzene	80.597
SW-846 8260	107-06-2	1,2-Dichloroethane	46.409
SW-846 8260	78-87-5	1,2-Dichloropropane	49.389
SW-846 8260	106-46-7	1,4-Dichlorobenzene	77.685
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	11.765
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	11.382
SW-846 8270	120-83-2	2,4-Dichlorophenol	12.903
SW-846 8270	105-67-9	2,4-Dimethylphenol	13.953
SW-846 8270	51-28-5	2,4-Dinitrophenol	12.346
SW-846 8270	121-14-2	2,4-Dinitrotoluene	9.677
SW-846 8270	606-20-2	2,6-Dinitrotoluene	10.526
SW-846 8260	78-93-3	2-Butanone	54.943
SW-846 8270	91-58-7	2-Chloronaphthalene	11.382
SW-846 8270	95-57-8	2-Chlorophenol	11.382
SW-846 8270	91-57-6	2-Methylnaphthalene	12.698

Test Method	CAS No.	Analyte	Max of RPD
SW-846 8270	95-48-7	2-Methylphenol	14.173
SW-846 8270	88-74-4	2-Nitroaniline	9.524
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	14.433
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	7.843
SW-846 8270	106-47-8	4-Chloroaniline	27.451
SW-846 8260	108-10-1	4-Methyl-2-pentanone	52.300
SW-846 8270	106-44-5	4-Methylphenol	13.534
SW-846 8270	100-02-7	4-Nitrophenol	9.091
SW-846 8270	83-32-9	Acenaphthene	11.570
SW-846 8260	67-64-1	Acetone	52.748
SW-846 6010	7429-90-5	Aluminum	67.173
SW-846 8270	120-12-7	Anthracene	11.200
SW-846 6010	7440-36-0	Antimony	17.054
SW-846 8082	12674-11-2	Aroclor-1016	5.042
SW-846 8082	11096-82-5	Aroclor-1260	15.674
SW-846 6010	7440-38-2	Arsenic	3.279
SW-846 6010	7440-39-3	Barium	41.951
SW-846 8260	71-43-2	Benzene	46.126
SW-846 8270	56-55-3	Benzo(a)anthracene	14.400
SW-846 8270	50-32-8	Benzo(a)pyrene	12.500
SW-846 8270	205-99-2	Benzo(b)fluoranthene	8.403
SW-846 8270	207-08-9	Benzo(k)fluoranthene	22.951
SW-846 8270	65-85-0	Benzoic acid	40.000
SW-846 8270	100-51-6	Benzyl alcohol	12.308
SW-846 6010	7440-41-7	Beryllium	5.988
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	15.385
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	11.570
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	13.740
SW-846 8260	75-27-4	Bromodichloromethane	52.030
SW-846 8260	75-25-2	Bromoform	59.888
SW-846 8260	74-83-9	Bromomethane	35.294
SW-846 8270	85-68-7	Butylbenzylphthalate	12.308
SW-846 6010	7440-43-9	Cadmium	3.468
SW-846 8260	75-15-0	Carbon disulfide	43.662
SW-846 8260	56-23-5	Carbon tetrachloride	56.221
SW-846 8260	108-90-7	Chlorobenzene	59.428
SW-846 8260	75-00-3	Chloroethane	37.174
SW-846 8260	67-66-3	Chloroform	48.098
SW-846 8260	74-87-3	Chloromethane	31.216
SW-846 6010	7440-47-3	Chromium	117.012
SW-846 8270	218-01-9	Chrysene	16.949

56

Test Method	CAS No.	Analyte	Max of RPD
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	52.427
SW-846 6010	7440-48-4	Cobalt	4.545
SW-846 6010	7440-50-8	Copper	9.778
SW-846 8270	84-74-2	Di-n-butylphthalate	14.173
SW-846 8270	117-84-0	Di-n-octylphthalate	14.876
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	14.876
SW-846 8270	132-64-9	Dibenzofuran	9.524
SW-846 8260	124-48-1	Dibromochloromethane	53.983
SW-846 8270	84-66-2	Diethylphthalate	7.634
SW-846 8270	131-11-3	Dimethylphthalate	10.526
SW-846 8260	100-41-4	Ethylbenzene	63.362
SW-846 8270	206-44-0	Fluoranthene	22.222
SW-846 8270	86-73-7	Fluorene	9.836
SW-846 8270	118-74-1	Hexachlorobenzene	12.121
SW-846 8270	87-68-3	Hexachlorobutadiene	9.929
SW-846 8260	87-68-3	Hexachlorobutadiene	113.295
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	20.408
SW-846 8270	67-72-1	Hexachloroethane	9.836
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	14.634
SW-846 6010	7439-89-6	Iron	140.760
SW-846 8270	78-59-1	Isophorone	14.035
SW-846 6010	7439-92-1	Lead	10.204
SW-846 6010	7439-93-2	Lithium	7.547
SW-846 6010	7439-96-5	Manganese	42.520
SW-846 6010	7439-97-6	Mercury	23.529
SW-846 8260	75-09-2	Methylene chloride	40.828
SW-846 6010	7439-98-7	Molybdenum	2.222
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	8.571
SW-846 8270	621-64-7	n-Nitrosodipropylamine	11.024
SW-846 8270	91-20-3	Naphthalene	11.570
SW-846 8260	91-20-3	Naphthalene	90.942
SW-846 6010	7440-02-0	Nickel	70.620
SW-846 8270	98-95-3	Nitrobenzene	14.173
SW-846 8270	87-86-5	Pentachlorophenol	7.692
SW-846 8270	108-95-2	Phenol	14.173
SW-846 8270	129-00-0	Pyrene	16.129
SW-846 6010	7782-49-2	Selenium	3.390
SW-846 6010	7440-22-4	Silver	3.846
SW-846 6010	7440-24-6	Strontium	79.859
SW-846 8260	100-42-5	Styrene	63.910
SW-846 8260	127-18-4	Tetrachloroethene	64.189

57

Test Method	CAS No.	Analyte	Max of RPD
SW-846 6010	7440-31-5	Tin	3.509
SW-846 8260	108-88-3	Toluene	51.752
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	52.659
SW-846 8260	79-01-6	Trichloroethene	52.642
SW-846 6010	11-09-6	Uranium, Total	7.821
SW-846 6010	7440-62-2	Vanadium	33.333
SW-846 8260	75-01-4	Vinyl chloride	33.290
SW-846 8260	1330-20-7	Xylene	64.494
SW-846 6010	7440-66-6	Zinc	16.216

Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 18 indicates that all field duplicate frequencies were greater than 5 percent.

Table 18
Field Duplicate Sample Frequency Summary

Test Method	Real	Duplicate	% Duplicate Samples
Alpha Spectroscopy	19	7	36.84%
Gamma Spectroscopy	61	10	14.93%
SW-846 6010	53	8	15.09%
SW-846 8082	53	8	15.09%
SW-846 8260	45	6	13.33%
SW-846 8270	53	8	15.09%

The RPD values indicate how much variation exists in the field duplicate analyses. EPA data validation guidelines state that "there are no required review criteria for field duplicate analyses comparability" (EPA 1994b). For the DQA, the highest concentrations for analytes with high RPD values (greater than 35 percent) (Table 19) were evaluated. For this project, chromium was high, however, project decisions were not impacted because the decision not to remediate was based on not only an AL comparison but also the results of the SSRS.

58

Table 19
RPD Evaluation Summary

Lab Code	Test Method	Analyte	Max of Result RPD
ESTLDEN	SW-846 8260	1,1,1-Trichloroethane	1.770
ESTLDEN	SW-846 8260	1,1-Dichloroethane	1.770
ESTLDEN	SW-846 8260	1,2,4-Trichlorobenzene	1.869
ESTLDEN	SW-846 8270	1,2,4-Trichlorobenzene	7.895
ESTLDEN	SW-846 8260	1,2-Dichloroethane	1.770
ESTLDEN	SW-846 8270	2,4,5-Trichlorophenol	7.895
ESTLDEN	SW-846 8270	2,4,6-Trichlorophenol	7.895
ESTLDEN	SW-846 8270	2,4-Dichlorophenol	7.895
ESTLDEN	SW-846 8270	2,4-Dimethylphenol	7.895
ESTLDEN	SW-846 8270	2,4-Dinitrophenol	8.000
ESTLDEN	SW-846 8270	2-Chloronaphthalene	7.895
ESTLDEN	SW-846 8270	2-Chlorophenol	7.895
ESTLDEN	SW-846 8270	2-Methylnaphthalene	7.895
ESTLDEN	SW-846 8270	2-Methylphenol	7.895
ESTLDEN	SW-846 8270	2-Nitroaniline	8.000
ESTLDEN	SW-846 8270	3,3'-Dichlorobenzidine	6.897
ESTLDEN	SW-846 8270	4,6-Dinitro-2-methylphenol	8.000
ESTLDEN	SW-846 8270	4-Chloroaniline	6.897
ESTLDEN	SW-846 8260	4-Methyl-2-pentanone	4.651
ESTLDEN	SW-846 8270	4-Methylphenol	7.895
ESTLDEN	SW-846 8270	4-Nitrophenol	8.000
ESTLDEN	SW-846 8270	Acenaphthene	8.000
ESTLDEN	SW-846 6010	Aluminum	85.714
ESTLDEN	Alpha Spectroscopy	Americium-241	18.841
ESTLDEN	SW-846 8270	Anthracene	8.000
ESTLDEN	SW-846 8082	Aroclor-1016	8.000
ESTLDEN	SW-846 8082	Aroclor-1221	8.000
ESTLDEN	SW-846 8082	Aroclor-1232	8.000
ESTLDEN	SW-846 8082	Aroclor-1242	8.000
ESTLDEN	SW-846 8082	Aroclor-1254	8.000
ESTLDEN	SW-846 8082	Aroclor-1260	4.878
ESTLDEN	SW-846 6010	Arsenic	41.935
ESTLDEN	SW-846 6010	Barium	58.065
ESTLDEN	SW-846 8260	Benzene	1.869
ESTLDEN	SW-846 8270	Benzo(a)anthracene	7.895
ESTLDEN	SW-846 8270	Benzo(a)pyrene	7.895
ESTLDEN	SW-846 8270	Benzo(b)fluoranthene	7.895
ESTLDEN	SW-846 8270	Benzo(k)fluoranthene	7.895
ESTLDEN	SW-846 8270	Benzoic acid	8.000

Lab Code	Test Method	Analyte	Max of Result RPD
ESTLDEN	SW-846 8270	Benzyl alcohol	6.897
ESTLDEN	SW-846 6010	Beryllium	30.986
ESTLDEN	SW-846 8270	bis(2-Chloroethyl)ether	7.895
ESTLDEN	SW-846 8270	bis(2-Chloroisopropyl)ether	7.895
ESTLDEN	SW-846 8270	bis(2-Ethylhexyl)phthalate	7.895
ESTLDEN	SW-846 8260	Bromodichloromethane	1.869
ESTLDEN	SW-846 8260	Bromoform	1.869
ESTLDEN	SW-846 8270	Butylbenzylphthalate	7.895
ESTLDEN	SW-846 6010	Cadmium	16.867
ESTLDEN	SW-846 8260	Carbon disulfide	1.869
ESTLDEN	SW-846 8260	Chlorobenzene	1.869
ESTLDEN	SW-846 8260	Chloroform	1.869
ESTLDEN	SW-846 6010	Chromium	94.737
ESTLDEN	SW-846 8270	Chrysene	7.895
ESTLDEN	SW-846 8260	cis-1,3-Dichloropropene	1.869
ESTLDEN	SW-846 6010	Cobalt	32.787
ESTLDEN	SW-846 6010	Copper	127.273
ESTLDEN	SW-846 8270	Di-n-butylphthalate	7.895
ESTLDEN	SW-846 8270	Di-n-octylphthalate	7.895
ESTLDEN	SW-846 8270	Dibenz(a,h)anthracene	7.895
ESTLDEN	SW-846 8270	Dibenzofuran	7.895
ESTLDEN	SW-846 8260	Dibromochloromethane	1.869
ESTLDEN	SW-846 8270	Diethylphthalate	7.895
ESTLDEN	SW-846 8270	Dimethylphthalate	7.895
ESTLDEN	SW-846 8270	Fluoranthene	7.895
ESTLDEN	SW-846 8270	Fluorene	7.895
ESTLDEN	SW-846 8270	Hexachlorobenzene	7.895
ESTLDEN	SW-846 8270	Hexachlorobutadiene	7.895
ESTLDEN	SW-846 8270	Hexachlorocyclopentadiene	7.895
ESTLDEN	SW-846 8270	Hexachloroethane	7.895
ESTLDEN	SW-846 8270	Indeno(1,2,3-cd)pyrene	7.895
ESTLDEN	SW-846 6010	Iron	110.000
ESTLDEN	SW-846 8270	Isophorone	7.895
ESTLDEN	SW-846 6010	Lead	57.143
ESTLDEN	SW-846 6010	Lithium	98.137
ESTLDEN	SW-846 6010	Manganese	153.982
ESTLDEN	SW-846 6010	Mercury	21.538
ESTLDEN	SW-846 8270	n-Nitrosodiphenylamine	7.895
ESTLDEN	SW-846 8270	n-Nitrosodipropylamine	7.895
ESTLDEN	SW-846 8260	Naphthalene	1.869
ESTLDEN	SW-846 8270	Naphthalene	7.895

60

Lab Code	Test Method	Analyte	Max of Result RPD
ESTLDEN	SW-846 6010	Nickel	127.869
ESTLDEN	SW-846 8270	Nitrobenzene	7.895
ESTLDEN	SW-846 8270	Pentachlorophenol	8.000
ESTLDEN	SW-846 8270	Phenol	7.895
ESTLDEN	Alpha Spectroscopy	Plutonium-239/240	39.612
ESTLDEN	SW-846 8270	Pyrene	7.895
ESTLDEN	SW-846 6010	Strontium	115.493
ESTLDEN	SW-846 8260	Styrene	1.869
ESTLDEN	SW-846 8260	Tetrachloroethene	1.770
ESTLDEN	SW-846 8260	Toluene	1.869
ESTLDEN	SW-846 8260	trans-1,3-Dichloropropene	1.770
ESTLDEN	SW-846 8260	Trichloroethene	1.869
ESTLDEN	SW-846 6010	Vanadium	90.598
ESTLDEN	SW-846 6010	Zinc	104.094

13.2.3 Completeness

Based on original project DQOs, a minimum of 25 percent of ER Program analytical (and radiological) results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. Table 20 shows that for this project all records were verified but none of the real data were validated. However, a QC sample (from Sampling Location CZ41-001 within Trench T-6) was validated. Also, a confirmation sample from Trench T-7, one of the East Trenches, was validated. In addition, the ER Program V&V goal of 25 percent is being met. During the nine-month 900-12 characterization and remediation period, data associated with IHSS Groups 000-2, 300-2, 400-2, 400-6, 400-7, 500-1, 500-2, 500-4, 500-5, 600-3, 600-4, 600-5, 700-2, 700-6, 700-7, 700-8, 700-11 and 900-2 were validated. Also, no records were rejected.

Table 20
Validation and Verification Summary

Validation Qualifier Code	Total of CAS Number	Alpha Spectroscopy	Gamma Spectroscopy	SW-846 6010	SW-846 8082	SW-846 8260	SW-846 8270
J1	309	0	0	309	0	0	0
JB1	7	0	0	0	0	7	0
UJ1	109	0	0	52	0	57	0
V1	6017	95	201	858	371	1736	2756
Total	6442	95	201	1219	371	1800	2756
Verified	6442	95	201	1219	371	1800	2756
% Verified	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

13.2.4 Sensitivity

RLs, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with RFCA WRW ALs. Adequate sensitivities of analytical methods were

61

attained for all COCs that affected remediation decisions. "Adequate" sensitivity is defined as an RL less than an analyte's associated AL, typically less than one-half the AL.

13.3 Summary of Data Quality

RPDs greater than 35 percent indicate the sampling precision limits of some analytes have been exceeded. Also, the validation percentages for the project are below 25 percent, however, the ER Program V&V goal of 25 percent is being met. Data collected and used for IHSS Group 900-12 are adequate for decision-making.

14.0 CONCLUSION

Results of the accelerated action justify NFAA. Justification is based on the reasons summarized below.

- No further accelerated action required based on surface soil data. All residual surface soil concentrations are less than WRW ALs.
- No further accelerated action required based on the SSRS. Subsurface soil in the area is not subject to significant erosion. Residual chemical concentrations and radionuclide activities that exceed their WRW ALs will be further evaluated in the AAESE and the ecological risk assessment portion of the Sitewide CRA. All other residual subsurface soil concentrations are less than WRW ALs.
- No further accelerated action based on the stewardship evaluation.

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62

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Appendix A
Correspondence

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time: September 2, 2004

Site Contact(s): DOE: Norma Castaneda
K-H: Lee Norland
K-H Team: Susan Serreze

Phone: 303/966-5223

Regulatory Contact: CDPHE: Dave Kruchek, Harlan Ainscough, Elizabeth Pottorff
EPA: Sam Garcia, Larry Kimmel

Phone: 303/692-2035-CDPHE
303/

Purpose of Contact: IHSS Group 900-12 Sampling.

Discussion
Additional samples will be collected as follows in accordance with BZSAP Addendum 04-02:
Trench 3 – 3 biased samples along the length of the trench;
Trench 4 – 3 biased samples along the length of the trench;
Trench 5 – 2 biased samples along the length of the trench;
Trench 10 – 2 biased samples along the length of the trench; and
Trench 11 – 3 biased samples along the length of the trench.
Samples will be collected to 2.5 feet (A and B intervals) and will be analyzed for radionuclides.

Contact Record Prepared By: Susan Serreze

Required Distribution:

M. Aguilar, USEPA
S. Bell, DOE-RFFO
J. Berardini, K-H
B. Birk, DOE-RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFFO
C. Deck, K-H Legal
S. Gunderson, CDPHE
R. McCallister, DOE-RFFO
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFFO
S. Serreze, K-H RISS
D. Shelton, K-H ESS

Additional Distribution:

H. Ainscough, CDPHE
J. Walstrom, K-H RISS

65

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	July 15, 2004/2:45	
Site Contact(s):	Annette Primrose	
Phone:	303 966-4385	
Regulatory Contact:	Sam Garcia	Harlen Ainscough
Phone:	303 312-6247	303 692-3337
Agency:	EPA	CDPHE

Purpose of Contact: Backfill of Trench 6 at IHSS Group 900-12

Discussion

Field screen samples from the excavation boundary and the north, south and east sides of Trench 6 at IHSS Group 900-12 were below action levels and samples have been submitted for offsite analyses. Excavation of the west side continues. Based on the screening results, most of this trench will be backfilled with the exception of the active excavation area.

Contact Record Prepared By: Annette Primrose

Required Distribution:

M. Aguilar, USEPA
H. Ainscough, CDPHE
S. Bell, DOE-RFPO
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
L. Butler, K-H RISS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFPO
C. Deck, K-H Legal
N. Demos, SSOC
S. Gunderson, CDPHE
M. Keating, K-H RISS
G. Kleeman, USEPA
D. Kruchek, CDPHE
J. Legare, DOE-RFPO
D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

Additional Distribution:

Sam Garcia, USEPA
Gerry Kelly, K-H RISS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	July 21, 2004/1615	
Site Contact(s):	Annette Primrose	
Phone:	303 966-4385	
Regulatory Contact:	Sam Garcia	Harlen Ainscough
Phone:	303 312-6247	303 692-3337
Agency:	EPA	CDPHE

Purpose of Contact: Backfill of Trench 6 and Trench 8 at IHSS Group 900-12

Discussion

Field screening sample results from the west excavation boundary of Trench 6 at IHSS Group 900-12 are below action levels and the sample has been submitted for offsite analyses. Based on the screening results, the remaining open section of the excavation will be backfilled.

Field screening sample results from all four sides of the excavation boundary of Trench 8 at IHSS Group 900-12 are below action levels and the samples have been submitted for offsite analyses. Based on the screening results, the excavation will be backfilled.

Contact Record Prepared By: Annette Primrose

Required Distribution:

M. Aguilar, USEPA
H. Ainscough, CDPHE
S. Bell, DOE-RFPO
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
L. Butler, K-H RISS
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J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

Additional Distribution:

Sam Garcia, USEPA
Gerry Kelly, K-H RISS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time: September 2, 2004

Site Contact(s): DOE: Norma Castaneda
K-H: Lee Norland
K-H Team: Susan Serreze

Phone: 303/966-5223

Regulatory Contact: CDPHE: Dave Kruchek, Harlan Ainscough, Elizabeth Pottorff
EPA: Sam Garcia, Larry Kimmel

Phone: 303/692-2035-CDPHE
303/

Purpose of Contact: IHSS Group 900-12 Sampling.

Discussion

Additional samples will be collected as follows in accordance with BZSAP Addendum 04-02:
Trench 3 – 3 biased samples along the length of the trench;
Trench 4 – 3 biased samples along the length of the trench;
Trench 5 – 2 biased samples along the length of the trench;
Trench 10 – 2 biased samples along the length of the trench; and
Trench 11 – 3 biased samples along the length of the trench.
Samples will be collected to 2.5 feet (A and B intervals) and will be analyzed for radionuclides.

Contact Record Prepared By: Susan Serreze

Required Distribution:

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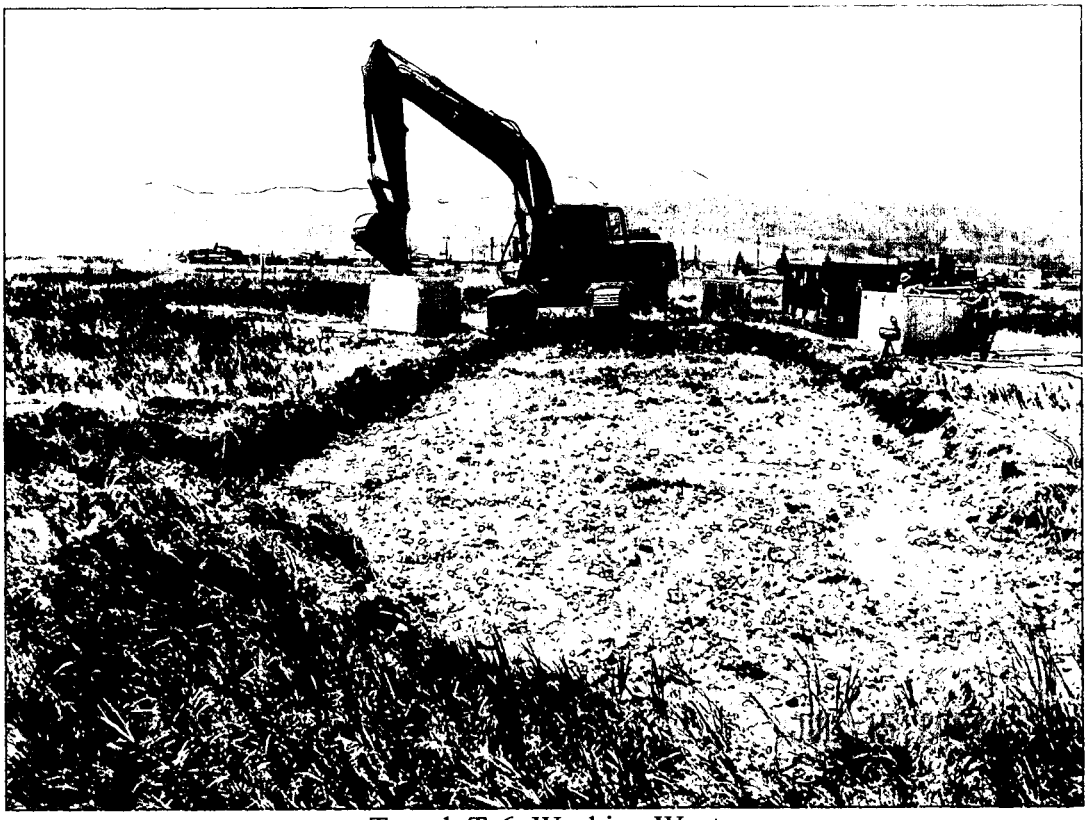
N. Castaneda, DOE-RFFO
C. Deck, K-H Legal
S. Gunderson, CDPHE
R. McCallister, DOE-RFFO
J. Mead, K-H ESS
S. Nesta, K-H RISS
L. Norland, K-H RISS
K. North, K-H ESS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
R. Schassburger, DOE-RFFO
S. Serreze, K-H RISS
D. Shelton, K-H ESS

Additional Distribution:

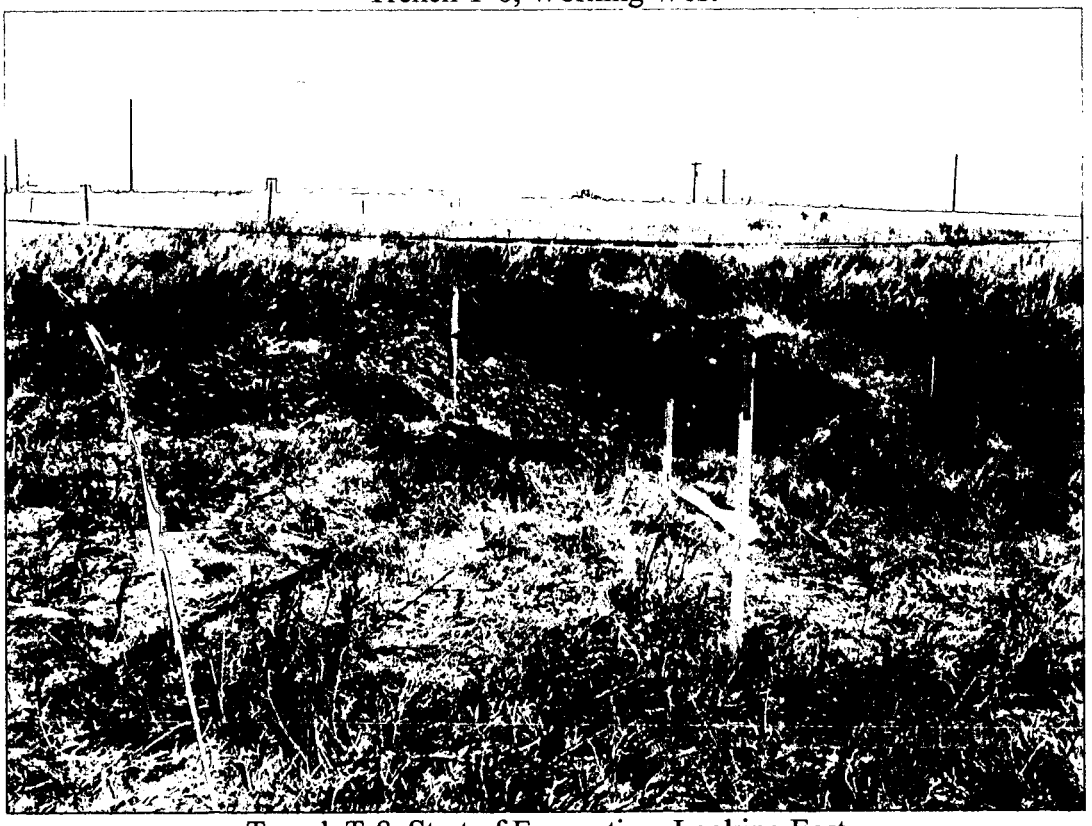
H. Ainscough, CDPHE
J. Walstrom, K-H RISS

68

Appendix B
Project Photographs



Trench T-6, Working West

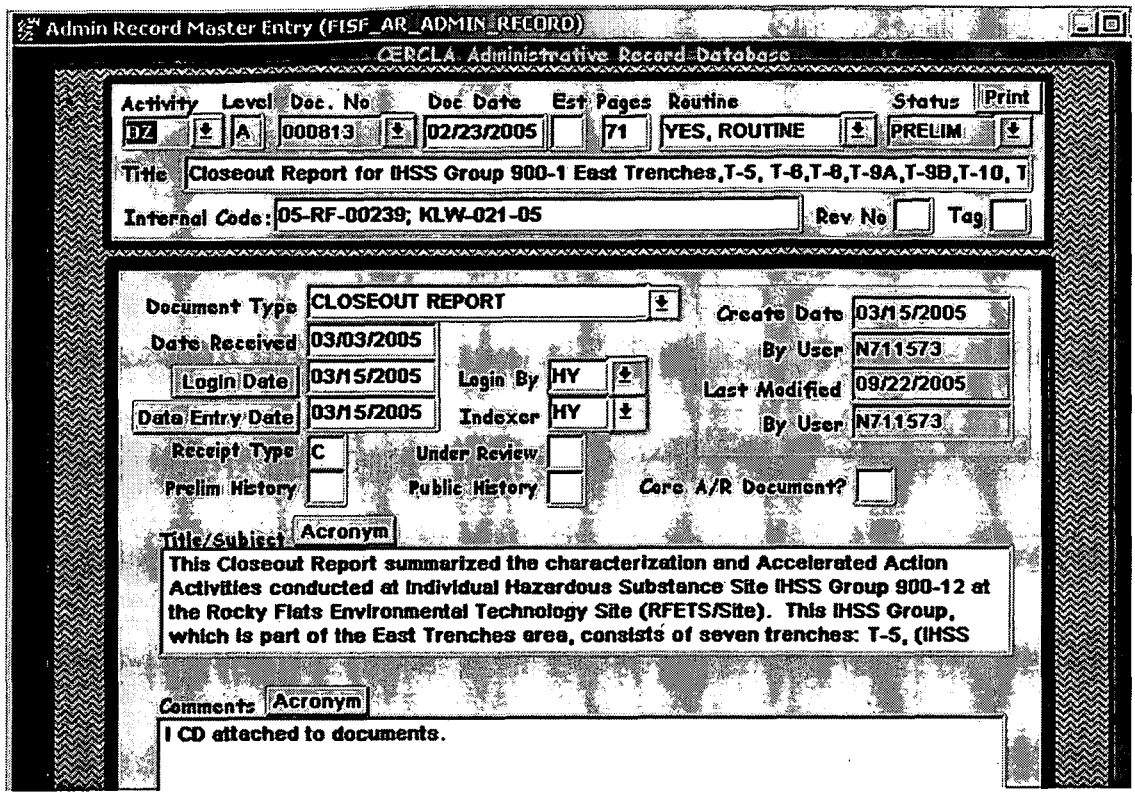


Trench T-8, Start of Excavation, Looking East

COMPACT DISC CONTAINING STANDARDIZED REAL AND QUALITY CONTROL DATA

ACCELERATED ACTION DATA

7/11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PRELIM
Title
Closeout Report for IHSS Group 900-1 East Trenches,T-5, T-6,T-8,T-9A,T-9B,T-10, T
Internal Code:
05-RF-00239; KLW-021-05
Rev No
Tag
Document Type
CLOSEOUT REPORT
Create Date
03/15/2005
Date Received
03/03/2005
By User
N711573
Login Date
03/15/2005
Login By
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Last Modified
09/22/2005
Data Entry Date
03/15/2005
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Prelim History
Public History
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Acronym
This Closeout Report summarized the characterization and Accelerated Action Activities conducted at Individual Hazardous Substance Site IHSS Group 900-12 at the Rocky Flats Environmental Technology Site (RFETS/Site). This IHSS Group, which is part of the East Trenches area, consists of seven trenches: T-5, (IHSS
Comments
Acronym
1 CD attached to documents.

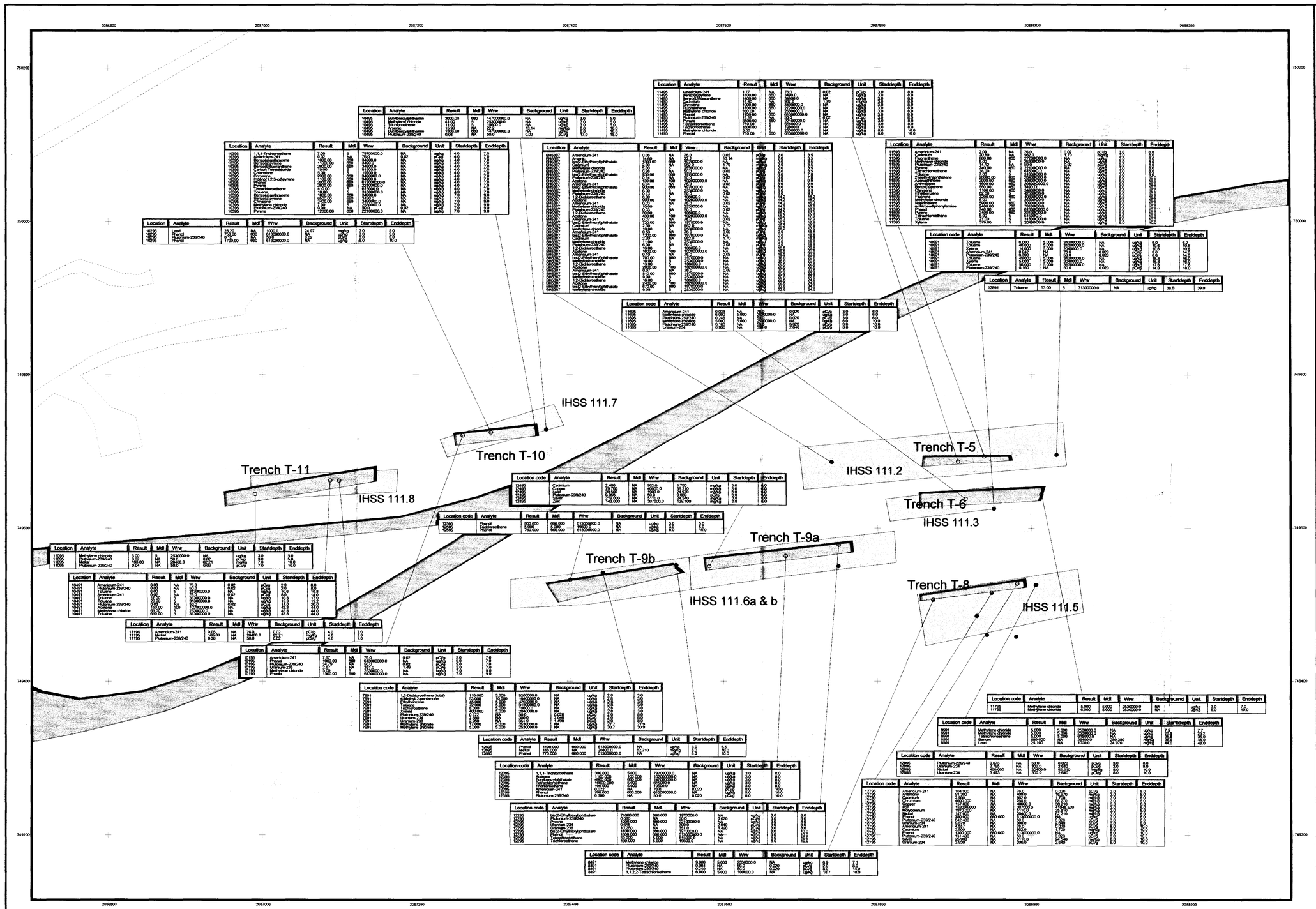


Figure 2
IHSS Group 900-12
Pre-Accelerated Action Soil
Sampling Locations and Results

KEY

- Sampling location with concentrations greater than WRW ALs
- Sampling location with concentrations less than WRW ALs and greater than background means plus two standard deviations or MDLs
- Sampling location with concentrations less than background means plus two standard deviations or MDLs

IHSS

Trench

Dirt road

Asphalt

N

Scale = 1:800

50 0 50 100 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

Date:12.02.2004

RADMS

Prepared for:

KAISER•HILL COMPANY

File:W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr

BZ-A-000813 Pg 16

Figure 3
IHSS Group 900-12
Characterization Sampling Locations and Results

KEY

- Sampling location with concentrations greater than WRW ALs
- Sampling location with concentrations less than WRW ALs and greater than background means plus two standard deviations or RLs

IHSS

Trench

Dirt road

Asphalt

Trench T-10

IHSS 111.7

Trench T-11

IHSS 111.8

IHSS 111.2

Trench T-5

IHSS 111.3

Trench T-6

IHSS 111.6a

IHSS 111.6b

Trench T-9b

Trench T-9a

Trench T-8

IHSS 111.5

N

Scale = 1:1,200

100 0 100 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

Date:12.02.2004

RADMS

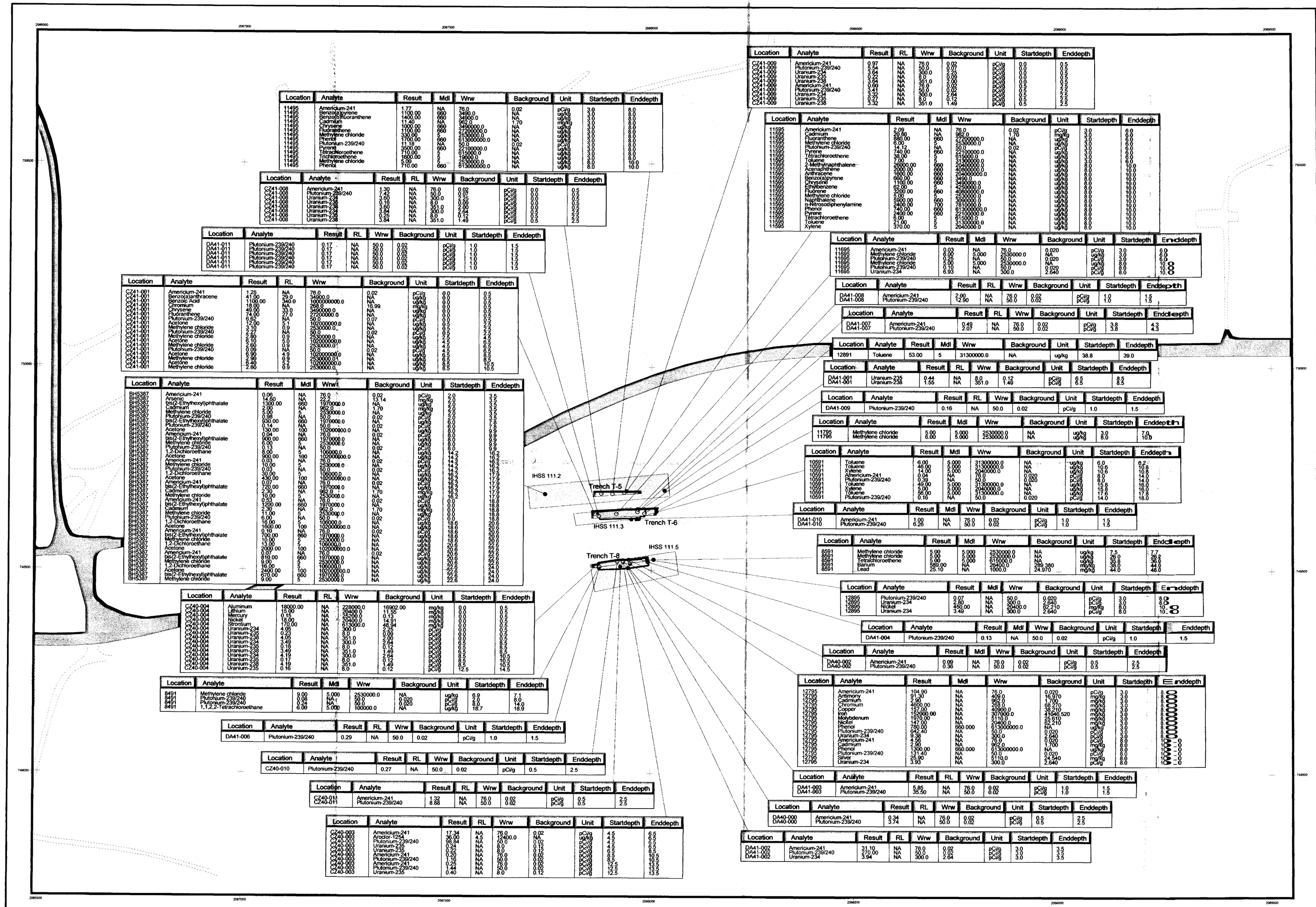
Prepared for:

KAISER•HILL COMPANY

File:W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr

BZ-A-000813 pg. 18

Figure 5
IHSS Group 900-12
Trenches T-5, T-6 and T-8
Residual Soil Concentrations



Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
11495	Americium-241	1.77	NA	76.0	0.02	pCi/g	3.0	8.0
11495	Benzo(a)pyrene	1100.00	660	3490.0	NA	ug/kg	3.0	8.0
11495	Benzo(b)fluoranthene	1400.00	660	34900.0	NA	ug/kg	3.0	8.0
11495	Cadmium	11.40	NA	962.0	1.70	mg/kg	3.0	8.0
11495	Chrysene	1000.00	660	34900.0	NA	ug/kg	3.0	8.0
11495	Fluoranthene	1100.00	660	272000000.0	NA	ug/kg	3.0	8.0
11495	Methylene chloride	330.00	5	2530000.0	NA	ug/kg	3.0	8.0
11495	Phenol	1700.00	660	613000000.0	NA	ug/kg	3.0	8.0
11495	Plutonium-239/240	11.18	NA	50.0	0.02	pCi/g	3.0	8.0
11495	Pyrene	3500.00	660	221000000.0	NA	ug/kg	3.0	8.0
11495	Tetrachloroethene	710.00	5	6150000.0	NA	ug/kg	3.0	8.0
11495	Trichloroethene	1600.00	5	196000.0	NA	ug/kg	3.0	8.0
11495	Methylene chloride	5.09	5	2530000.0	NA	ug/kg	8.0	10.0
11495	Phenol	710.00	660	613000000.0	NA	ug/kg	8.0	10.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CZ41-008	Americium-241	1.30	NA	76.0	0.02	pCi/g	0.0	0.5
CZ41-008	Plutonium-239/240	7.42	NA	50.0	0.07	pCi/g	0.0	0.5
CZ41-008	Uranium-234	3.60	NA	300.0	2.25	pCi/g	0.0	0.5
CZ41-008	Uranium-235	0.16	NA	8.0	0.09	pCi/g	0.0	0.5
CZ41-008	Uranium-238	3.60	NA	351.0	2.00	pCi/g	0.0	0.5
CZ41-008	Uranium-234	3.84	NA	300.0	2.64	pCi/g	0.5	2.5
CZ41-008	Uranium-235	0.25	NA	8.0	0.12	pCi/g	0.5	2.5
CZ41-008	Uranium-238	3.84	NA	351.0	1.49	pCi/g	0.5	2.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-011	Plutonium-239/240	0.17	NA	50.0	0.02	pCi/g	1.0	1.5
DA41-011	Plutonium-239/240	0.17	NA	50.0	0.02	pCi/g	1.0	1.5
DA41-011	Plutonium-239/240	0.17	NA	50.0	0.02	pCi/g	1.0	1.5
DA41-011	Plutonium-239/240	0.17	NA	50.0	0.02	pCi/g	1.0	1.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CZ41-001	Americium-241	1.25	NA	76.0	0.02	pCi/g	0.0	0.5
CZ41-001	Benzo(a)anthracene	41.00	29.0	34900.0	NA	ug/kg	0.0	0.5
CZ41-001	Benzoic Acid	1100.00	340.0	1000000000.0	NA	ug/kg	0.0	0.5
CZ41-001	Chromium	18.00	NA	268.0	18.99	mg/kg	0.0	0.5
CZ41-001	Chrysene	46.00	29.0	34900.0	NA	ug/kg	0.0	0.5
CZ41-001	Fluoranthene	74.00	27.0	272000000.0	NA	ug/kg	0.0	0.5
CZ41-001	Plutonium-239/240	6.82	NA	50.0	0.07	pCi/g	0.0	0.5
CZ41-001	Acetone	12.00	5.1	1020000000.0	NA	ug/kg	1.5	2.5
CZ41-001	Methylene chloride	3.10	0.9	2530000.0	NA	ug/kg	1.5	2.5
CZ41-001	Plutonium-239/240	2.27	NA	50.0	0.02	pCi/g	1.5	2.5
CZ41-001	Methylene chloride	2.80	0.9	2530000.0	NA	ug/kg	2.5	4.5
CZ41-001	Acetone	6.10	5.0	1020000000.0	NA	ug/kg	4.5	6.5
CZ41-001	Methylene chloride	2.60	0.9	2530000.0	NA	ug/kg	4.5	6.5
CZ41-001	Plutonium-239/240	0.09	NA	50.0	0.02	pCi/g	4.5	6.5
CZ41-001	Acetone	6.90	4.9	1020000000.0	NA	ug/kg	6.5	8.5
CZ41-001	Methylene chloride	2.90	0.9	2530000.0	NA	ug/kg	6.5	8.5
CZ41-001	Acetone	6.40	5.2	1020000000.0	NA	ug/kg	8.5	10.5
CZ41-001	Methylene chloride	2.80	0.9	2530000.0	NA	ug/kg	8.5	10.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
BH5387	Americium-241	0.06	NA	76.0	0.02	pCi/g	2.0	3.5
BH5387	Arsenic	14.60	NA	22.2	13.14	mg/kg	2.0	3.5
BH5387	bis(2-Ethylhexyl)phthalate	1300.00	660	1970000.0	NA	ug/kg	2.0	3.5
BH5387	Cadmium	2.00	5A	962.0	1.70	mg/kg	2.0	3.5
BH5387	Methylene chloride	5.00	5	2530000.0	NA	ug/kg	2.0	3.5
BH5387	Plutonium-239/240	0.38	NA	50.0	0.02	pCi/g	2.0	3.5
BH5387	bis(2-Ethylhexyl)phthalate	930.00	660	1970000.0	NA	ug/kg	6.0	7.8
BH5387	Plutonium-239/240	0.14	NA	50.0	0.02	pCi/g	6.0	7.8
BH5387	Acetone	130.00	100	1020000000.0	NA	ug/kg	6.0	7.8
BH5387	Americium-241	0.04	NA	76.0	0.02	pCi/g	8.0	9.9
BH5387	bis(2-Ethylhexyl)phthalate	900.00	660	1970000.0	NA	ug/kg	8.0	9.9
BH5387	Methylene chloride	6.00	5	2530000.0	NA	ug/kg	8.0	9.9
BH5387	Plutonium-239/240	0.13	NA	50.0	0.02	pCi/g	8.0	9.9
BH5387	1,2-Dichloroethane	8.00	5	106000.0	NA	ug/kg	14.2	16.2
BH5387	Acetone	900.00	100	1020000000.0	NA	ug/kg	14.2	16.2
BH5387	Americium-241	0.03	NA	76.0	0.02	pCi/g	14.2	16.2
BH5387	Methylene chloride	10.00	5	2530000.0	NA	ug/kg	14.2	16.2
BH5387	Plutonium-239/240	0.07	NA	50.0	0.02	pCi/g	14.2	16.2
BH5387	1,2-Dichloroethane	430.00	100	106000.0	NA	ug/kg	16.2	17.9
BH5387	Acetone	430.00	100	1020000000.0	NA	ug/kg	16.2	17.9
BH5387	Americium-241	0.07	NA	76.0	0.02	pCi/g	16.2	17.9
BH5387	bis(2-Ethylhexyl)phthalate	720.00	660	1970000.0	NA	ug/kg	16.2	17.9
BH5387	Cadmium	2.20	NA	962.0	1.70	mg/kg	16.2	17.9
BH5387	Methylene chloride	10.00	5	2530000.0	NA	ug/kg	16.2	17.9
BH5387	Americium-241	0.53	NA	76.0	0.02	pCi/g	0.0	18.8
BH5387	bis(2-Ethylhexyl)phthalate	1200.00	660	1970000.0	NA	ug/kg	0.0	18.8
BH5387	Cadmium	2.20	NA	962.0	1.70	mg/kg	0.0	18.8
BH5387	Methylene chloride	11.00	5	2530000.0	NA	ug/kg	0.0	18.8
BH5387	1,2-Dichloroethane	9.00	5A	106000.0	NA	ug/kg	0.0	18.8
BH5387	Acetone	16.00	5	1020000000.0	NA	ug/kg	18.6	20.6
BH5387	Americium-241	0.10	NA	76.0	0.02	pCi/g	18.6	20.6
BH5387	bis(2-Ethylhexyl)phthalate	700.00	660	1970000.0	NA	ug/kg	18.6	20.6
BH5387	Methylene chloride	11.00	5	2530000.0	NA	ug/kg	18.6	20.6
BH5387	1,2-Dichloroethane	11.00	5	106000.0	NA	ug/kg	18.6	20.6
BH5387	Acetone	2000.00	100	1020000000.0	NA	ug/kg	18.6	20.6
BH5387	Americium-241	0.10	NA	76.0	0.02	pCi/g	20.6	22.6
BH5387	bis(2-Ethylhexyl)phthalate	810.00	660	1970000.0	NA	ug/kg	20.6	22.6
BH5387	Methylene chloride	9.00	5	2530000.0	NA	ug/kg	20.6	22.6
BH5387	1,2-Dichloroethane	14.00	5	106000.0	NA	ug/kg	20.6	22.6
BH5387	Acetone	2400.00	100	1020000000.0	NA	ug/kg	20.6	22.6
BH5387	bis(2-Ethylhexyl)phthalate	670.00	660	1970000.0	NA	ug/kg	22.6	24.0
BH5387	Methylene chloride	9.00	5	2530000.0	NA	ug/kg	22.6	24.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CZ40-004	Aluminum	18000.00	NA	228000.0	16902.00	mg/kg	0.0	0.5
CZ40-004	Lithium	15.00	NA	20400.0	11.95	mg/kg	0.0	0.5
CZ40-004	Mercury	0.15	NA	252.0	0.13	mg/kg	0.0	0.5
CZ40-004	Nickel	18.00	NA	20400.0	14.31	mg/kg	0.0	0.5
CZ40-004	Strontium	170.00	NA	613000.0	86.94	mg/kg	0.0	0.5
CZ40-004	Uranium-234	4.95	NA	300.0	2.25	pCi/g	0.0	0.5
CZ40-004	Uranium-235	0.43	NA	8.0	0.09	pCi/g	0.0	0.5
CZ40-004	Uranium-238	4.95	NA	351.0	2.00	pCi/g	0.0	0.5
CZ40-004	Uranium-234	3.48	NA	300.0	2.64	pCi/g	0.5	2.5
CZ40-004	Uranium-235	0.18	NA	8.0	0.12	pCi/g	0.5	2.5
CZ40-004	Uranium-238	3.48	NA	351.0	1.49	pCi/g	0.5	2.5
CZ40-004	Uranium-234	4.17	NA	300.0	2.64	pCi/g	8.5	10.5
CZ40-004	Uranium-238	4.17	NA	351.0	1.49	pCi/g	8.5	10.5
CZ40-004	Uranium-235	0.19	NA	8.0	0.12	pCi/g	12.5	14.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
8491	Methylene chloride	9.00	5.000	2530000.0	NA	ug/kg	6.9	7.1
8491	Plutonium-239/240	0.08	NA	50.0	0.020	pCi/g	8.0	14.0
8491	Plutonium-239/240	0.34	NA	50.0	0.020	pCi/g	14.0	18.7
8491	1,1,2,2-Tetrachloroethane	6.00	5.000	160000.0	NA	ug/kg	18.7	18.9

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-006	Plutonium-239/240	0.29	NA	50.0	0.02	pCi/g	1.0	1.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CZ40-010	Plutonium-239/240	0.27	NA	50.0	0.02	pCi/g	0.5	2.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CZ40-011	Americium-241	1.32	NA	76.0	0.02	pCi/g	0.5	2.5
CZ40-011	Plutonium-238/240	8.88	NA	50.0	0.02	pCi/g	0.5	2.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CZ40-003	Americium-241	17.04	NA	76.0	0.02	pCi/g	4.5	6.5
CZ40-003	Aroclor-1254	36.00	NA	4.7	2400.0	ug/kg	4.5	6.5
CZ40-003	Plutonium-239/240	28.64	NA	50.0	0.02	pCi/g	4.5	6.5
CZ40-003	Uranium-235	0.25	NA	8.0	0.15	pCi/g	4.5	6.5
CZ40-003	Uranium-238	0.50	NA	351.0	2.00	pCi/g	6.5	8.5
CZ40-003	Americium-241	1.19	NA	76.0	0.02	pCi/g	8.5	10.5
CZ40-003	Plutonium-239/240	0.26	NA	50.0	0.02	pCi/g	8.5	10.5
CZ40-003	Americium-241	1.42	NA	76.0	0.02	pCi/g	12.5	13.2
CZ40-003	Plutonium-239/240	1.42	NA	50.0	0.02	pCi/g	12.5	13.2
CZ40-003	Uranium-235	0.40	NA	8.0	0.12	pCi/g	12.5	13.2

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CZ41-009	Americium-241	0.97	NA	76.0	0.02	pCi/g	0.0	0.5
CZ41-009	Plutonium-239/240	3.64	NA	50.0	0.07	pCi/g	0.0	0.5
CZ41-009	Uranium-234	3.54	NA	300.0	2.25	pCi/g	0.0	0.5
CZ41-009	Uranium-238	0.22	NA	8.0	0.09	pCi/g	0.0	0.5
CZ41-009	Uranium-238	3.54	NA	351.0	2.00	pCi/g	0.0	0.5
CZ41-009	Americium-241	0.66	NA	76.0	0.02	pCi/g	0.5	2.5
CZ41-009	Plutonium-239/240	3.41	NA	50.0	0.07	pCi/g	0.5	2.5
CZ41-009	Uranium-234	0.39	NA	300.0	2.64	pCi/g	0.5	2.5
CZ41-009	Uranium-235	0.47	NA	8.0	0.12	pCi/g	0.5	2.5
CZ41-009	Uranium-238	3.32	NA	351.0	1.49	pCi/g	0.5	2.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
11695	Americium-241	2.09	NA	76.0	0.02	pCi/g	3.0	6.0
11695	Cadmium	20.80	NA	962.0	1.70	mg/kg	3.0	6.0
11695	Fluoranthene	880.00	660	272000000.0	NA	ug/kg	3.0	6.0
11695	Methylene chloride	6.00	5	2530000.0	NA	ug/kg	3.0	6.0
11695	Plutonium-239/240	14.70	NA	50.0	0.02	pCi/g	3.0	6.0
11695	Pyrene	740.00	660	221000000.0	NA	ug/kg	3.0	6.0
11695	Tetrachloroethene	35.00	5	6150000.0	NA	ug/kg	3.0	6.0
11695	Toluene	7.00	5	2040000.0	NA	ug/kg	3.0	6.0
11695	2-Methylnaphthalene	20000.00	660	20400000.0	NA	ug/kg	8.0	10.0
11695	Acenaphthene	2000.00	660	20400000.0	NA	ug/kg	8.0	10.0
11695	Anthracene	1000.00	660	20400000.0	NA	ug/kg	8.0	10.0
11695	Benzo(a)pyrene	1100.00	660	3490.0	NA	ug/kg	8.0	10.0
11695	Chrysene	1700.00	660	34900.0	NA	ug/kg	8.0	10.0
11695	Fluorobenzene	6200.00	660	4080000.0	NA	ug/kg	8.0	10.0
11695	Indene	3300.00	660	4080000.0	NA	ug/kg	8.0	10.0
11695	Methylene chloride	5.00	5	2530000.0	NA	ug/kg	8.0	10.0
11695	N-Nitrosodiphenylamine	2400.00	660	784000.0	NA	ug/kg	8.0	10.0
11695	Phenol	2400.00	660	613000000.0	NA	ug/kg	8.0	10.0
11695	Pyrene	7400.00	660	221000000.0	NA	ug/kg	8.0	10.0
11695	Tetrachloroethene	6.00	5	6150000.0	NA	ug/kg	8.0	10.0
11695	Toluene	51.00	5	2040000.0	NA	ug/kg	8.0	10.0
11695	Xylene	370.00	5	2040000.0	NA	ug/kg	8.0	10.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
11695	Americium-241	0.03	NA	76.0	0.020	pCi/g	3.0	6.0
11695	Methylene chloride	5.00	5.000	2530000.0	NA	ug/kg	3.0	6.0
11695	Plutonium-239/240	0.25	NA	50.0	0.020	pCi/g	3.0	6.0
11695	Methylene chloride	5.00	5.000	2530000.0	NA	ug/kg	8.0	10.0
11695	Plutonium-239/240	0.11	NA	50.0	0.020	pCi/g	8.0	10.0
11695	Uranium-234	6.93	NA	300.0	2.640	pCi/g	8.0	10.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-008	Americium-241	2.00	NA	76.0	0.02	pCi/g	1.0	1.5
DA41-008	Plutonium-239/240	12.90	NA	50.0	0.02	pCi/g	1.0	1.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-007	Americium-241	0.49	NA	76.0	0.02	pCi/g	3.8	4.3
DA41-007	Plutonium-239/240	2.07	NA	50.0	0.02	pCi/g	3.8	4.3

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12891	Toluene	53.00	5	31300000.0	NA	ug/kg	38.8	39.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-001	Uranium-235	0.44	NA	8.0	0.15	pCi/g	8.5	8.5
DA41-001	Uranium-238	1.55	NA	351.0	1.49	pCi/g	8.5	8.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-009	Plutonium-239/240	0.16	NA	50.0	0.02	pCi/g	1.0	1.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
11795	Methylene chloride	5.00	5.000	2530000.0	NA	ug/kg	3.0	7.0
11795	Methylene chloride	8.00	5.000	2530000.0	NA	ug/kg	8.0	10.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
10591	Toluene	6.00	5.000	31300000.0	NA	ug/kg	6.0	6.2
10591	Toluene	48.00	5.000	31300000.0	NA	ug/kg	10.6	10.8
10591	Xylene	14.00	5.000	20400000.0	NA	ug/kg	10.6	10.8
10591	Americium-241	0.04	NA	76.0	0.020	pCi/g	8.0	14.0
10591	Plutonium-239/240	0.39	NA	50.0	0.020	pCi/g	8.0	14.0
10591	Toluene	49.00	5.000	31300000.0	NA	ug/kg	15.6	15.8
10591	Xylene	5.00	5.000	20400000.0	NA	ug/kg	15.8	16.0
10591	Toluene	56.00	5.000	31300000.0	NA	ug/kg	17.6	17.8
10591	Plutonium-239/240	0.16	NA	50.0	0.020	pCi/g	14.0	18.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
DA41-010	Americium-241	1.00	NA	76.0	0.02	pCi/g	1.0	1.5
DA41-010	Plutonium-239/240	6.26	NA	50.0	0.02	pCi/g	1.0	1.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
8591	Methylene chloride	5.00	5.000	2530000.0	NA	ug/kg	7.5	7.7
8591	Methylene chloride	5.00	5.000	2530000.0	NA	ug/kg	36.0	36.2
8591	Tetrachloroethene	5.00	5.000	6150000.0	NA	ug/kg	30.0	30.2
8591	Barium	589.00	NA	29400.0	289.380	mg/kg	38.0	44.0
8591	Lead	25.10	NA	1000.0	24.970	mg/kg	44.0	48.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12895	Plutonium-239/240	0.07	NA	50.0	0.020	pCi/g	3.0	8.0
12895	Uranium-234	2.48	NA	300.0	2.640	pCi/g	3.0	8.0
12895	Nickel	450.00	NA	20400.0	82.210	mg/kg	8.0	10.0
12895	Uranium-234	3.49	NA	300.0	2.640	pCi/g	8.0	10.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
DA41-004	Plutonium-239/240	0.13	NA	50.0	0.02	pCi/g	1.0	1.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
DA40-002	Americium-241	0.09	NA	76.0	0.02	pCi/g	0.5	2.5
DA40-002	Plutonium-239/240	0.36	NA	50.0	0.02	pCi/g	0.5	2.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12795	Americium-241	104.90	NA	76.0	0.020	pCi/g	3.0	8.0
12795	Antimony	91.30	NA	409.0	16.670	mg/kg	3.0	8.0
12795	Cadmium	2.90	NA	962.0	1.700	mg/kg	3.0	8.0
12795	Chromium	4600.00	NA	268.0	68.270	mg/kg	3.0	8.0
12795	Copper	152.00	NA	40900.0	38.210	mg/kg	3.0	8.0
12795	Iron	152000.00	NA	307000.0	41045.520	mg/kg	3.0	8.0
12795	Molybdenum	1970.00	NA	5110.0	23.810	mg/kg	3.0	8.0
12795	Nickel	147.00	NA	20400.0	82.210	mg/kg	3.0	8.0
12795	Phenol	780.00	660.000	613000000.0	NA	ug/kg	3.0	8.0
12795	Plutonium-239/240	642.40	NA	50.0	0.020	pCi/g	3.0	8.0
12795	Uranium-234	9.38	NA	300.0	2.640	pCi/g	3.0	8.0
12795	Americium-241	4.50	NA	76.0	0.020	pCi/g	8.0	10.0
12795	Cadmium	2.30	NA	962.0	1.700	mg/kg	8.0	10.0
12795	Phenol	1300.00	660.000	613000000.0	NA	ug/kg	8.0	10.0
12795	Plutonium-239/240	181.40	NA	50.0	0.020	pCi/g	8.0	10.0
12795	Silver	23.90	NA	5110.0	24.540	mg/kg	8.0	10.0
12795	Uranium-234	3.93	NA	300.0	2.640	pCi/g	8.0	10.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-003	Americium-241	5.85	NA	76.0	0.02	pCi/g	1.0	1.5
DA41-003	Plutonium-239/240	38.50	NA	50.0	0.02	pCi/g	1.0	1.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA40-000	Americium-241	0.34	NA	76.0	0.02	pCi/g	0.5	2.5
DA40-000	Plutonium-239/240	3.74	NA	50.0	0.02	pCi/g	0.5	2.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
DA41-002	Americium-241	31.10	NA	76.0	0.02	pCi/g	3.0	3.5
DA41-002	Plutonium-239/240	270.00	NA	50.0	0.02	pCi/g	3.0	3.5
DA41-002	Uranium-234	3.94	NA	300.0	2.64	pCi/g	3.0	3.5

KEY

- Sampling location with concentrations greater than WRW ALs
- Sampling location with concentrations less than WRW ALs and greater than background means plus two standard deviations or MDLs/RLs

IHSS

Trench

Excavation boundary

Dirt road

Asphalt

N

Scale = 1: 1500

175 0 175 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

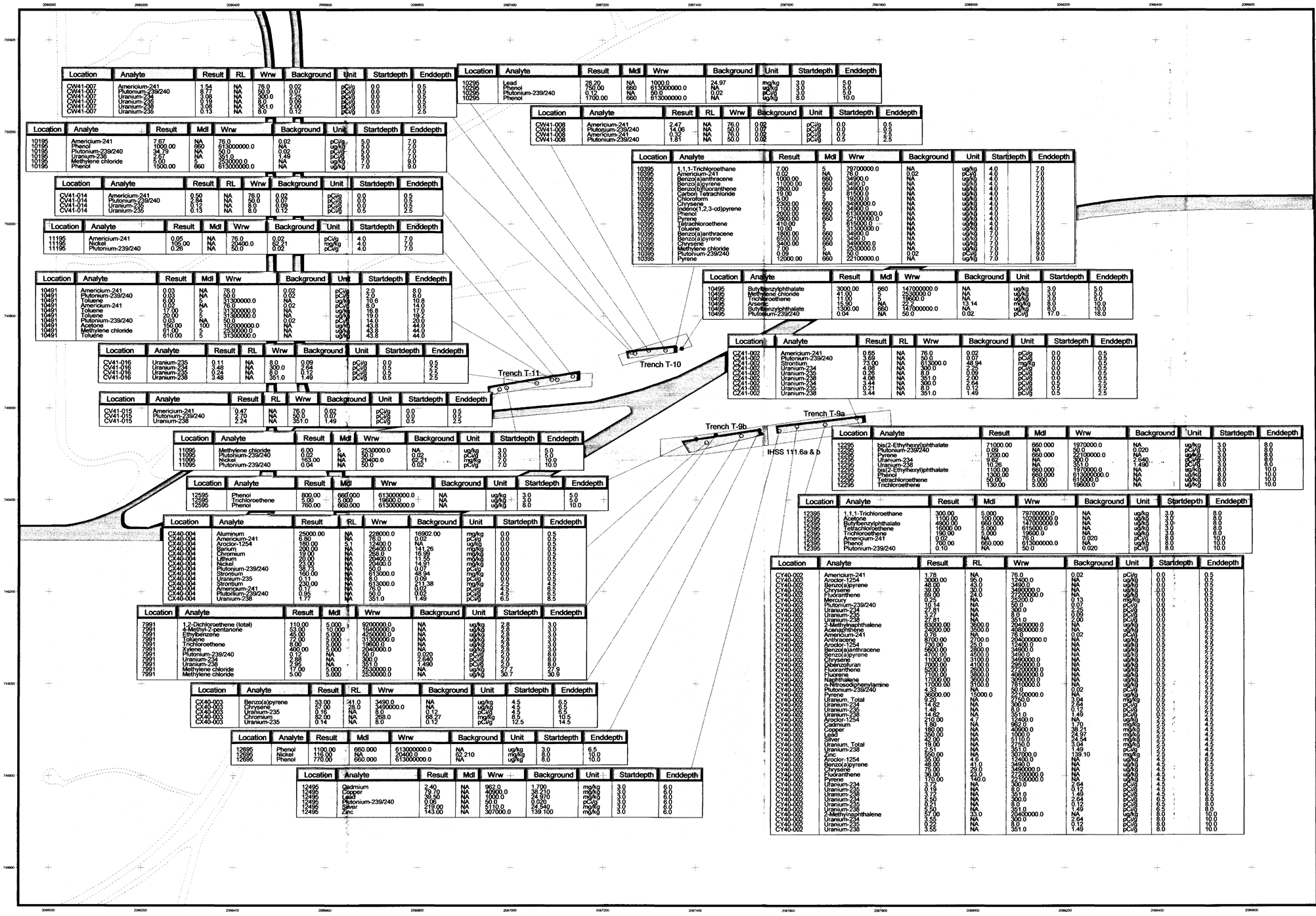
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: RADMS Date: 12.14.04

Prepared for: KAISER•HILL COMPANY

File: W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr

Figure 6
IHSS Group 900-12
Trenches T-9a, T-9b, T-10 and T-11 Residual Soil Concentrations



Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CW41-007	Americium-241	1.54	NA	76.0	0.02	pCi/g	0.0	0.5
CW41-007	Plutonium-239/240	8.77	NA	50.0	0.07	pCi/g	0.0	0.5
CW41-007	Uranium-234	3.08	NA	300.0	2.25	pCi/g	0.0	0.5
CW41-007	Uranium-235	0.19	NA	8.0	0.09	pCi/g	0.0	0.5
CW41-007	Uranium-238	3.08	NA	351.0	2.00	pCi/g	0.0	0.5
CW41-007	Uranium-235	0.13	NA	8.0	0.12	pCi/g	0.5	2.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
10295	Lead	28.20	NA	1000.0	24.97	mg/kg	3.0	5.0
10295	Phenol	750.00	660	613000000.0	NA	ug/kg	3.0	5.0
10295	Plutonium-239/240	0.10	0.0	50.0	0.02	pCi/g	0.5	2.5
10295	Phenol	1700.00	660	613000000.0	NA	ug/kg	8.0	10.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CW41-008	Americium-241	2.47	NA	76.0	0.02	pCi/g	0.0	0.5
CW41-008	Plutonium-239/240	14.06	NA	50.0	0.07	pCi/g	0.0	0.5
CW41-008	Americium-241	0.32	NA	76.0	0.02	pCi/g	0.5	2.5
CW41-008	Plutonium-239/240	1.81	NA	50.0	0.02	pCi/g	0.5	2.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
10195	Americium-241	7.67	NA	76.0	0.02	pCi/g	5.0	7.0
10195	Phenol	1000.00	660	613000000.0	NA	ug/kg	5.0	7.0
10195	Plutonium-239/240	34.79	NA	50.0	0.02	pCi/g	5.0	7.0
10195	Uranium-238	2.67	NA	351.0	1.49	pCi/g	5.0	7.0
10195	Methylene chloride	5.00	5	2530000.0	NA	ug/kg	7.0	9.0
10195	Phenol	1500.00	660	613000000.0	NA	ug/kg	7.0	9.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CV41-014	Americium-241	0.50	NA	76.0	0.02	pCi/g	0.0	0.5
CV41-014	Plutonium-239/240	2.94	NA	50.0	0.07	pCi/g	0.0	0.5
CV41-014	Uranium-235	0.12	NA	8.0	0.09	pCi/g	0.0	0.5
CV41-014	Uranium-235	0.13	NA	8.0	0.12	pCi/g	0.5	2.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
11195	Americium-241	0.05	NA	76.0	0.02	pCi/g	4.0	7.0
11195	Nickel	105.00	NA	20400.0	62.21	mg/kg	4.0	7.0
11195	Plutonium-239/240	0.26	NA	50.0	0.02	pCi/g	4.0	7.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
10395	1,1,1-Trichloroethane	7.00	5	79700000.0	NA	ug/kg	4.0	7.0
10395	Americium-241	0.02	NA	76.0	0.02	pCi/g	4.0	7.0
10395	Benzo(a)anthracene	1000.00	660	34900.0	NA	ug/kg	4.0	7.0
10395	Benzo(a)pyrene	1100.00	660	3490.0	NA	ug/kg	4.0	7.0
10395	Benzo(b)fluoranthene	2800.00	660	34900.0	NA	ug/kg	4.0	7.0
10395	Carbon Tetrachloride	19.00	5	615000.0	NA	ug/kg	4.0	7.0
10395	Chloroform	5.00	5	19200.0	NA	ug/kg	4.0	7.0
10395	Chrysene	2300.00	660	3490000.0	NA	ug/kg	4.0	7.0
10395	Indeno(1,2,3-cd)pyrene	1100.00	660	34900.0	NA	ug/kg	4.0	7.0
10395	Phenol	2000.00	660	613000000.0	NA	ug/kg	4.0	7.0
10395	Pyrene	3800.00	660	22100000.0	NA	ug/kg	4.0	7.0
10395	Tetrachloroethene	410.00	5	615000.0	NA	ug/kg	4.0	7.0
10395	Toluene	10.00	5	313000000.0	NA	ug/kg	4.0	7.0
10395	Benzo(a)anthracene	1800.00	660	34900.0	NA	ug/kg	7.0	9.0
10395	Benzo(a)pyrene	1600.00	660	3490.0	NA	ug/kg	7.0	9.0
10395	Chrysene	3400.00	660	3490000.0	NA	ug/kg	7.0	9.0
10395	Methylene chloride	7.00	5	2530000.0	NA	ug/kg	7.0	9.0
10395	Plutonium-239/240	0.09	NA	50.0	0.02	pCi/g	7.0	9.0
10395	Pyrene	12000.00	660	22100000.0	NA	ug/kg	7.0	9.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
10491	Americium-241	0.03	NA	76.0	0.02	pCi/g	2.0	8.0
10491	Plutonium-239/240	0.03	NA	50.0	0.02	pCi/g	2.0	8.0
10491	Toluene	6.00	5	313000000.0	NA	ug/kg	10.6	10.8
10491	Americium-241	0.02	NA	76.0	0.02	pCi/g	8.0	14.0
10491	Toluene	17.00	5	313000000.0	NA	ug/kg	16.8	17.0
10491	Toluene	20.00	5	313000000.0	NA	ug/kg	19.0	19.2
10491	Plutonium-239/240	0.03	NA	50.0	0.02	pCi/g	14.0	20.0
10491	Acetone	150.00	100	1020000000.0	NA	ug/kg	43.8	44.0
10491	Methylene chloride	61.00	5	2530000.0	NA	ug/kg	43.8	44.0
10491	Toluene	610.00	5	313000000.0	NA	ug/kg	43.8	44.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CV41-016	Uranium-235	0.11	NA	8.0	0.09	pCi/g	0.0	0.5
CV41-016	Uranium-234	3.46	NA	300.0	2.64	pCi/g	0.0	0.5
CV41-016	Uranium-235	0.24	NA	8.0	0.12	pCi/g	0.5	2.5
CV41-016	Uranium-238	3.48	NA	351.0	1.49	pCi/g	0.5	2.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CV41-015	Americium-241	0.47	NA	76.0	0.02	pCi/g	0.0	0.5
CV41-015	Plutonium-239/240	2.70	NA	50.0	0.07	pCi/g	0.0	0.5
CV41-015	Uranium-238	2.24	NA	351.0	1.49	pCi/g	0.5	2.5

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
C241-002	Americium-241	0.65	NA	76.0	0.02	pCi/g	0.0	0.5
C241-002	Plutonium-239/240	3.69	NA	50.0	0.07	pCi/g	0.0	0.5
C241-002	Strontium	73.00	NA	613000.0	48.94	mg/kg	0.0	0.5
C241-002	Uranium-234	4.98	NA	300.0	2.25	pCi/g	0.0	0.5
C241-002	Uranium-235	0.26	NA	8.0	0.09	pCi/g	0.0	0.5
C241-002	Uranium-238	4.08	NA	351.0	2.00	pCi/g	0.0	0.5
C241-002	Uranium-234	3.44	NA	300.0	2.64	pCi/g	0.5	2.5
C241-002	Uranium-235	0.21	NA	8.0	0.12	pCi/g	0.5	2.5
C241-002	Uranium-238	3.44	NA	351.0	1.49	pCi/g	0.5	2.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
10495	Butylbenzylphthalate	3000.00	660	1470000000.0	NA	ug/kg	3.0	5.0
10495	Methylene chloride	41.00	5	2530000.0	NA	ug/kg	3.0	5.0
10495	Trichloroethene	11.00	5	19600.0	NA	ug/kg	3.0	5.0
10495	Arsenic	11.90	NA	22.3	13.14	mg/kg	8.0	10.0
10495	Butylbenzylphthalate	1300.00	660	1470000000.0	NA	ug/kg	8.0	10.0
10495	Plutonium-239/240	0.04	NA	50.0	0.02	pCi/g	17.0	18.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
11095	Methylene chloride	6.00	5	2530000.0	NA	ug/kg	3.0	5.0
11095	Plutonium-239/240	0.02	NA	50.0	0.02	pCi/g	3.0	5.0
11095	Nickel	163.00	NA	20400.0	62.21	mg/kg	7.0	10.0
11095	Plutonium-239/240	0.04	NA	50.0	0.02	pCi/g	7.0	10.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12595	Phenol	800.00	660.000	613000000.0	NA	ug/kg	3.0	5.0
12595	Trichloroethene	5.00	5.000	19600.0	NA	ug/kg	3.0	5.0
12595	Phenol	780.00	660.000	613000000.0	NA	ug/kg	8.0	10.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12295	bis(2-Ethylhexyl)phthalate	71000.00	660.000	1970000.0	NA	ug/kg	3.0	8.0
12295	Plutonium-239/240	0.09	NA	50.0	0.020	pCi/g	3.0	8.0
12295	Pyrene	1200.00	660.000	22100000.0	NA	ug/kg	3.0	8.0
12295	Uranium-234	9.82	NA	300.0	2.640	pCi/g	3.0	8.0
12295	Uranium-238	10.26	NA	351.0	1.490	pCi/g	3.0	8.0
12295	bis(2-Ethylhexyl)phthalate	1100.00	660.000	1970000.0	NA	ug/kg	8.0	10.0
12295	Phenol	1400.00	660.000	613000000.0	NA	ug/kg	8.0	10.0
12295	Tetrachloroethene	90.00	5.000	615000.0	NA	ug/kg	8.0	10.0
12295	Trichloroethene	130.00	5.000	19600.0	NA	ug/kg	8.0	10.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12395	1,1,1-Trichloroethane	300.00	5.000	79700000.0	NA	ug/kg	3.0	8.0
12395	Acetone	1100.00	100.000	1020000000.0	NA	ug/kg	3.0	8.0
12395	Butylbenzylphthalate	4900.00	660.000	1470000000.0	NA	ug/kg	3.0	8.0
12395	Tetrachloroethene	16000.00	5.000	615000.0	NA	ug/kg	3.0	8.0
12395	Trichloroethene	190.00	5.000	19600.0	NA	ug/kg	3.0	8.0
12395	Americium-241	0.02	NA	76.0	0.020	pCi/g	8.0	10.0
12395	Phenol	1700.00	660.000	613000000.0	NA	ug/kg	8.0	10.0
12395	Plutonium-239/240	0.10	NA	50.0	0.020	pCi/g	8.0	10.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CX40-004	Aluminum	25000.00	NA	228000.0	16902.00	mg/kg	0.0	0.5
CX40-004	Americium-241	6.80	NA	76.0	0.02	pCi/g	0.0	0.5
CX40-004	Aroclor-1254	180.00	NA	12400.0	NA	ug/kg	0.0	0.5
CX40-004	Barium	200.00	NA	26400.0	141.26	mg/kg	0.0	0.5
CX40-004	Chromium	19.00	NA	268.0	16.99	mg/kg	0.0	0.5
CX40-004	Lithium	20.00	NA	20400.0	11.55	mg/kg	0.0	0.5
CX40-004	Nickel	23.00	NA	20400.0	14.91	mg/kg	0.0	0.5
CX40-004	Plutonium-239/240	38.73	NA	50.0	0.07	pCi/g	0.0	0.5
CX40-004	Strontium	160.00	NA	613000.0	48.94	mg/kg	0.0	0.5
CX40-004	Uranium-235	0.11	NA	8.0	0.09	pCi/g	0.0	0.5
CX40-004	Strontium	230.00	NA	613000.0	211.38	mg/kg	2.2	4.5
CX40-004	Americium-241	0.17	NA	76.0	0.02	pCi/g	4.5	6.5
CX40-004	Plutonium-239/240	0.95	NA	50.0	0.02	pCi/g	4.5	6.5
CX40-004	Uranium-238	1.77	NA	351.0	1.49	pCi/g	6.5	8.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
7991	1,2-Dichloroethene (total)	110.00	5.000	9200000.0	NA	ug/kg	2.8	3.0
7991	4-Methyl-2-pentanone	53.00	10.000	16400000.0	NA	ug/kg	2.8	3.0
7991	Ethylbenzene	45.00	5.000	4250000.0	NA	ug/kg	2.8	3.0
7991	Toluene	72.00	5.000	313000000.0	NA	ug/kg	2.8	3.0
7991	Trichloroethene	8.00	5.000	19600.0	NA	ug/kg	2.8	3.0
7991	Xylene	400.00	5.000	2040000.0	NA	ug/kg	2.8	3.0
7991	Plutonium-239/240	0.12	NA	50.0	0.020	pCi/g	2.0	8.0
7991	Uranium-234	2.65	NA	300.0	2.640	pCi/g	2.0	8.0
7991	Uranium-238	2.95	NA	351.0	1.490	pCi/g	2.0	8.0
7991	Methylene chloride	17.00	5.000	2530000.0	NA	ug/kg	27.7	27.9
7991	Methylene chloride	5.00	5.000	2530000.0	NA	ug/kg	30.7	30.9

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CX40-003	Benzo(a)pyrene	53.00	41.0	3490.0	NA	ug/kg	4.5	6.5
CX40-003	Chrysene	57.00	28.0	349000.0	NA	ug/kg	4.5	6.5
CX40-003	Uranium-235	0.16	NA	8.0	0.12	pCi/g	4.5	6.5
CX40-003	Chromium	82.00	NA	268.0	88.27	mg/kg	8.5	10.5
CX40-003	Uranium-235	0.14	NA	8.0	0.12	pCi/g	12.5	14.5

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12695	Phenol	1100.00	660.000	613000000.0	NA	ug/kg	3.0	6.5
12695	Nickel	116.00	NA	20400.0	82.210	mg/kg	8.0	10.0
12695	Phenol	770.00	660.000	613000000.0	NA	ug/kg	8.0	10.0

Location	Analyte	Result	Mdl	Wrw	Background	Unit	Startdepth	Enddepth
12495	Cadmium	2.40	NA	962.0	1.700	mg/kg	3.0	6.0
12495	Copper	79.70	NA	40900.0	38.210	mg/kg	3.0	6.0
12495	Lead	38.50	NA	1000.0	24.970	mg/kg	3.0	6.0
12495	Plutonium-239/240	0.08	NA	50.0	0.020	pCi/g	3.0	6.0
12495	Silver	219.00	NA	5110.0	24.540	mg/kg	3.0	6.0
12495	Zinc	143.00	NA	307000.0	139.100	mg/kg	3.0	6.0

Location	Analyte	Result	RL	Wrw	Background	Unit	Startdepth	Enddepth
CY40-002	Americium-241	1.78	NA	76.0	0.02	pCi/g	0.0	0.5
CY40-002	Aroclor-1254	3000.00	NA	12400.0	NA	ug/kg	0.0	0.5
CY40-002	Benzo(a)pyrene	48.00	43.0	3490.0	NA	ug/kg	0.0	0.5
CY40-002	Chrysene	89.00	29.0	3490000.0	NA	ug/kg	0.0	0.5
CY40-002	Fluoranthene	89.00	24.0	2740000.0	NA	ug/kg	0.0	0.5
CY40-002	Mercury	0.25	NA	2520.0	0.13	mg/kg	0.0	0.5
CY40-002	Plutonium-239/240	10.14	NA	50.0	0.07	pCi/g	0.0	0.5
CY40-002	Uranium-234	27.81	NA	300.0	2.25	pCi/g	0.0	0.5
CY40-002	Uranium-235	3.27	NA	8.0	0.09	pCi/g	0.0	0.5
CY40-002	Uranium-238	27.81	NA	351.0	2.00	pCi/g	0.0	0.5
CY40-002	2-Methylnaphthalene	83000.00	3500.0	4080000.0	NA	ug/kg	0.5	2.5
CY40-002	Acenaphthene	24000.00	3500.0	4080000.0	NA	ug/kg	0.5	2.5
CY40-002	Americium-241	0.76	NA	76.0	0.02	pCi/g	0.5	2.5
CY40-002	Anthracene	8700.00	2700.0	20400000.0	NA	ug/kg	0.5	2.5
CY40-002	Aroclor-1254	7300.00	2800.0	24000.0	NA	ug/kg	0.5	2.5
CY40-002	Benzo(a)anthracene	5600.00	2800.0	34900.0	NA	ug/kg	0.5	2.5
CY40-002	Benzo(a)pyrene	4700.00	4500.0	3490.0	NA	ug/kg	0.5	2.5
CY40-002	Chrysene	11000.00	3100.0	3490000.0	NA	ug/kg	0.5	2.5
CY40-002	Dibenzofuran	7000.00	4100.0	2950000.0	NA	ug/kg	0.5	2.5
CY40-002	Fluoranthene	5200.00	2600.0	27200000.0	NA	ug/kg	0.5	2.5
CY40-002	Fluorene	7100.00	3800.0	4080000.0	NA	ug/kg	0.5	2.5
CY40-002	Naphthalene	17000.00	3600.0	3950000.0	NA	ug/kg	0.5	2.5
CY40-002	n-Nitrosodiphenylamine	17000.00	3100.0	781000.0	NA	ug/kg	0.5	2.5
CY40-002	Plutonium-239/240	4.33	NA	50.0	0.02	pCi/g	0.5	2.5
CY40-002	Pyrene	36000.00	15000.0	22100000.0	NA	ug/kg	0.5	2.5
CY40-002	Uranium, Total	9.20	NA	2760.0	3.04	mg/kg	0.5	2.5
CY40-002	Uranium-234	14.62	NA	300.0	2.64	pCi/g	0.5	2.5
CY40-002	Uranium-235	1.48	NA	8.0	0.12	pCi/g	0.5	2.5
CY40-002	Uranium-238	14.62	NA	351.0	1.49	pCi/g	0.5	2.5
CY40-002	Aroclor-1254	210.00	4.7	12400.0	NA	ug/kg	2.5	4.5
CY40-002	Cadmium	1.80	NA	962.0	1.70	mg/kg	2.5	4.5
CY40-002	Copper	160.00	NA	40900.0	38.21	mg/kg	2.5	4.5
CY40-002	Lead	350.00	NA	1000.0	24.97	mg/kg	2.5	4.5
CY40-002	Silver	42.00	NA	5110.0	24.54	mg/kg	2.5	4.5
CY40-002	Uranium, Total	19.00	NA	2760.0	3.04	mg/kg	2.5	4.5
CY40-002	Uranium-238	2.51	NA	351.0	1.49	pCi/g	2.5	4.5
CY40-002	Zinc	560.00	NA	307000.0	139.10	mg/kg	2.5	4.5
CY40-002	Aroclor-1254	35.00	4.6	12400.0	NA	ug/kg	4.5	6.5
CY40-002	Benzo(a)pyrene	48.00	41.0	3490.0	NA	ug/kg	4.5	6.5
CY40-002	Chrysene	76.00	28.0	3490000.0	NA	ug/kg	4.5	6.5
CY40-002	Fluoranthene	36.00	23.0	2740000.0	NA	ug/kg	4.5	6.5
CY40-002	Pyrene	170.00	1400.0	22100000.0	NA	ug/kg	4.5	6.5
CY40-002	Uranium-234	3.72	NA	300.0	2.64	pCi/g	4.5	6.5
CY40-002	Uranium-235	0.19	NA	8.0	0.12	pCi/g	4.5	6.5
CY40-002	Uranium-238	3.72	NA	351.0	1.49	pCi/g	4.5	6.5
CY40-002	Uranium-234	5.50	NA	300.0	2.64	pCi/g	6.5	8.0
CY40-002	Uranium-235	0.21	NA	8.0	0.12	pCi/g	6.5	8.0
CY40-002	Uranium-238	5.50	NA	351.0	1.49	pCi/g	6.5	8.0
CY40-002	2-Methylnaphthalene	57.00	33.0	4080000.0	NA	ug/kg	8.0	10.0
CY40-002	Uranium-234	3.55	NA	300.0	2.64	pCi/g	8.0	10.0
CY40-002	Uranium-235	0.22	NA	8.0	0.12	pCi/g	8.0	10.0
CY40-002	Uranium-238	3.55	NA	351.0	1.49	pCi/g	8.0	10.0

KEY

- Sampling location with concentrations greater than WRW ALs
- Sampling location with concentrations less than WRW ALs and greater than background means plus two standard deviations or MDLs/RLs

IHSS

Trench

Dirt road

Asphalt

N

Scale = 1: 1375

175 0 175 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 12.14.04

Prepared by: RADMS

Prepared for: KAISER•HILL COMPANY

File: W:\Projects\Fy2004\900-12\char_confrm_hist_120104.apr